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ANNALS

OF

OPHTHALMOLOGY

A QUARTERLY JOURNAL AND REVIEW OF

OPHTHALMIC SCIENCE.

FOUNDED BY JAMES PLEASANT PARKER.

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PUBLISHED QUARTERLY,

BY JONES H. PARKER,

St. Louis, Mo., U. S. A.

VOL. XII.

1903.

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INDEX OF ORIGINAL ARTICLES FOR THE YEAR 1903.

BORDLEY, JAS., JR., M. D., A Case of Acute Glaucoma with Iritis Following Cataract Extraction...	246
BULL, GORGE J., M. D., The Accommodative Asthenopia of Donders	405
DUANE, ALEXANDER, M. D., The Value of the Screen Test as a Precise Means of Measuring Squint.....	620
FOX, L. WEBSTER, A. M., M. D., Peritomy or Peridectomy	614
HENDERSON, F. L., M. D., A Case of Tuberculosis of the Conjunctiva.....	427
JOHNSON, R. H., M. D., Papillomata of the Conjunctiva and Cornea.....	435
LEWIS, EUGENE RICHARDS, M. D., The Conservation of Binocular Single Vision	9
MURRAY, GILBERT D., M. D., An Examination, Personally Conducted, of 4,608 Railroad Employees for Acuity of Vision, Hearing and Color Perception....	55
OLIVER, CHARLES, A., A. M., M. D., The So-Called Mydriatics; Their Actions, Their Uses and Their Dangers in Ophthalmology.....	589
POSEY, WM. CAMPBELL, M. D., Report of Two Cases of Congenital Anomalies of the Eyes, Illustrating the Transmission of Such Defects from Mother to Daughter	1
REIK, H. O., M. D., Why Not Employ Intra-capsular Irrigation in Cataract Operations?.....	416
SNYDACKER, E. F., M. D., Anomalous Direction of Retinal Vessels on Emerging from and Entering Optic Disc.....	225
SUKER, GORGE F., M. D., Paraffin—Its Use in the Formation of a Stump after an Enucleation.....	51
TAYLOR, C. BELL, M. D., A Clinical Lecture on the Art of Extraction for Cataract.....	441
VINSONHALER, L. FRANK, M. D., Extraction of a Particle of Steel with the Giant Magnet.....	618

WING, P. B., M. D., Report of a Case of Toxic Amblyopia from Coffee.....	232
WOODRUFF, H. W., M. D., Report of Cases of Extensive Symblepharon an of Shrunken and Obliterated Cul de sacs, Relieved by Skin Grafting.....	217
WÜRDEMANN, H. V., M. D., Cure of Pulsating Exophthalmus by Ligature of the Common Cartoid Artery	235
Clinical Observations on a Probable Case of Intraocular Cysticerci Occuring in Both Eyes.....	581
ZIMMERMANN, C., M. D., } Clinical and Histological Report of a Case of Purulent Me-	
and } tastatic Ophthalmia in Menin-	
PUSEY, BROWN, M. D., } gitis, Giving Rise to Meningitic and Sympathetic Symptoms after Thirteen Years.....	446
ZIMMERMANN, M. W., M. D., Four Eye Injuries with Introduction of Foreign Substances Not Suitable for Removal by Magnet.....	239

INDEX OF AUTHORS FOR THE YEAR 1903. VOL. XII.

Aalbertsberg, 725.	Birch-Hirschfeld, 704.
Abadie, 81, 677, 692.	Bischoff, 494.
Aguilar, 137.	Bjerrum, 486.
Ahlstrom, 147, 469.	Black, N. M., 133.
Alexander, 700.	Blok, 721.
Alonso, 735.	Blum, 150.
Alt, 132.	Blumberg, 153.
Alvarado, 138.	Rock, 145, 255, 263.
Alvarez, 138.	Boesa, 707.
Ando, 366.	Bordley, 246.
Angelucci, 163.	Bose, 340.
Anna, 151.	Rossalino, 350.
Aoki, 171.	Bothen, 579.
Arakawana, 174.	Bouchart, 462.
Armaignac, 63.	Bordeaux, 463.
Asayma, 364.	Bourgeois, 64.
Ascher, 80.	Brandes, 718.
Aschheim, 777.	Bruhl, 149.
Ascunee, 733.	Buch, 727.
Ashby, 528.	Buchanan, 511.
Axenfeld, 140, 254, 779.	Bull, Geo. J., 371, 405.
Ayres, 104.	Bull, Chas. S., 640.
	Burnham, 124.
Baas, 703.	Bylsma, 161, 485, 722.
Badal, 70.	
Bailey, 531.	Cajal, 773.
Baker, A. R., 644.	Caldebaro, 167.
Barraquer, 734.	Caldemeyer, 146.
Barton, 701.	Campos, 372.
Basso, 736.	Capanner, 67.
Baudry, 343.	Capellini, 168.
Becker, 151.	Cause, 150.
Bellizona, 169.	Chacon, 135, 734.
Berger, 252.	Chaillous, 476.
Bernhardt, 495.	Chance, 500.
Bernheimer, 212.	Chevallereau, 476.
Bethemieux, 693.	Grincione, 496.
Bichelonne, 476.	Claiborne, 652.

- Clarke, 101.
 Cohen, 576.
 Colburn, 100.
 Collins, 317.
 Collomb, 462.
 Colombo, 738.
 Constantinesco, 342.
 Coppez, 338, 339, 341, 465, 686.
 Corda, 745.
 Corsini, 129.
 Cox, 183.
 Cruchandeau, 466, 467.

 Danvers, 393.
 Darier, 79, 82, 459, 480, 578, 691.
 Dean, 641.
 Deaver, 396.
 De Lapersonne, 79, 474, 678, 685.
 Demicheri, 66, 70, 135, 137, 370, 373.
 De Schweinitz, 305, 656.
 Desgouttes, 477.
 Deshusses, 466.
 De Vries, 178, 186, 268.
 Dhont, 181, 271.
 Dianoux, 469.
 Dimmer, 149.
 Dodge, 318.
 D'Oench, 310.
 Donath, 357.
 Doyne, 659.
 Duane, 620.
 Dujardin, 71.

 Edsall, 656.
 Eldridge-Green, 94, 322.
 Ellett, 97, 508, 647.
 Emmert, 253.
 Enslin, 263.
 Erwin, 509.
 Evans, 312.
 Ewart, 643.
 Ewing, 276.

 Faber, 179.
 Fage, 690.
 Fejer, 303, 359.
 Ferron, 73.
 Fisher, 281.
 Flath, 152.
 Fleming, 517.
 Fox, 614.
 Friedenwald, 321.
 Friedenberg, 293, 543, 661.
 Friedmann, 89.
 Fromaget, 470.
 Frost, F., 636.
 Fuchs, 256, 487.
 Fueth, 153.

 Galewski, 478.
 Galiano, 741.
 Galtier, 74.
 Gardiner, 103.
 Genth, 158.
 Gerok, 498.
 Gerson, 142.
 Gifford, 110, 131, 633.
 Gilfillan, 646.
 Ginsberg, 401.
 Goldberg, 702.
 Goldzeilher, 702.
 Gonin, 74, 344, 468, 472.
 Gonzales, 374.
 Gould, 106, 398.
 Gradle, 327, 662.
 Grafin, 493.
 Groenouw, 211.
 Guilbert, 80.
 Guilio, 346.
 Guillery, 145.
 Guiot, 479.
 Gunn, 117.
 Haab, 155.

 Haeme'schild, 361.
 Hala, 728.
 Hall, 274.
 Halmers, 339.
 Handmann, 158.
 Hanke, 773.
 Harrington, 529, 530.
 Hegg, 209.
 Heumann, 251, 260.
 Heinsberger, 151.
 Helbron, 260.
 Henderson, 427.
 Hess, 213.
 Hippel, 483.
 Hirsch, 490.
 Hocheim, 258.
 Holden, 638.
 Hoebe, 724.
 Holmes, 298.
 Holtz, 472.
 Hoof, 358.
 Hotz, 536.
 Hurd, 638.

 Immerman, 708.
 Inouye, 363.

 Jackson, Ewd., 89, 104, 125, 280, 662, 666, 669.
 Jacovides, 464.
 Jacquean, 252.
 James, 670.
 Jellinek, 251.
 Jocqs, 82, 479, 480.
 Johnston, 435.
 Jolly, 143.

 Kalt, 681.
 Kikutsi, 172.
 Kipp, 674.
 Knapp, Arnold, 672.
 Koeber, 481.
 Koenig, 772.
 Koenigsberger, 214, 568.
 Komoto, 171, 171, 364, 367.
 Königstein, 548.
 Kono, 714.
 Kopff, 72.
 Koppen, 81, 156.
 Koster, 188.
 Koster-Gzn, 698.
 Kuhn, 489.
 Kurka, 158.

 Ladd, 320.
 La Motte, 114.
 Landolt, 337, 474, 573.
 Lans, 180.
 La Roux, 680.
 Lauber, 154.
 Leber, 778.
 Leeser, 259.
 Leloutre, 482.
 Lenhossek, 572.
 Le Prince, 460.
 Levi, 341.
 Levison, 141, 154, 315.
 Lewis, 9, 507.
 Lezenius, 157.
 Liebreich, 72, 162, 316.
 Lindenmeyer, 776.
 Lister, 513.
 Locenius, 256.
 Lodge, 109.
 Lor, 65.
 Loring, 293.
 Ludwig, 155.
 Luttge, 155.

 MacCallan, 524.
 Maddox, 81.
 Main, 657.
 Mandonnet, 469.

- Manz, 258.
 Marcel, 695.
 Marple, 116.
 Matys, 539.
 Maxwell, 534.
 May, 784.
 Mayeda, 141, 147, 497.
 Maynard, 527.
 Mayou, 287.
 Mayweg, 159.
 Mazet, 689.
 Meige, 471.

 Menachr, 373.
 Mengelburg, 484.
 Menzies, 123.
 Meyer, 250.
 Miller, 532.
 Mishima, 368.
 Mizno, 173.
 Mohr, 546.
 Montano, 734.
 Monthus, 338.
 Morax, 684.
 Mori, 172.
 Morton, 311, 333, 639.
 Moulton, 510.
 Mueller, 477.
 Murray, 55.

 Nakaizumi, 366, 707.
 Neuburger, 700, 703.
 Neustaetter, 697.
 Nicati, 685.
 Nicola, 167.
 Nicolai, 181, 266, 720, 725.
 Nieden, 700, 701.
 Nimi, 170.

 Oatmann, 285, 307.
 Obarrio, 135.
 Oertel, 403.
 Ogchu, 713.
 Ogusti, 173.
 Oliver, Chas., 325, 589.
 Oliver, Thos., 208.
 Opin, 338.
 Oppenheimer, 262.
 Orr, 275.
 Osborne, 697.

 Pal, 494.
 Partillo, 733.
 Paus, 68, 69, 74, 75, 78, 79, 336.
 Parson, 118, 310, 311.
 Petella, 166.
 Phillips, 402.
 Pick, 704.
 Pino, 187, 724.
 Piroux, 690.
 Pollack, 491.
 Pollatsek, 728.
 Posey, 1, 95.
 Posey & Wright, 215.
 Poulard, 688.
 Priout, 71.
 Pusey, 215, 446, 658.
 Pyle, 120.

 Quintela, 372.

 Radl, 570.
 Ramas, 374.
 Ramsay, 283, 461, 545, 637.
 Randolph, 120, 130.
 Reik, 416.
 Reynolds, 519.
 Richard, 259.
 Risley, 87, 331, 505.
 Robinson, 329.
 Rochon Duvigneaud, 678.
 Roemer, 257.
 Rollet, 342, 466.

 Roques, 479.
 Roselli, 743, 744.
 Rosner, 547.
 Ruffel, 80.
 Ruppel, von, 158.
 Rutter, 161.

 Sachs, 711.
 Sachsaler, 729.
 Salomonsohn, 485, 698.
 Salva, 67, 739.
 Salzmann, 731.
 Santos, 136.
 Savage, 107.
 Schaumann, 696.
 Schenkel, 152.
 Schirmer, 160.
 Schnaudigel, 697.
 Schoen, 112.
 Schoute, 270, 706, 723.
 Schuftan, 152.
 Schulek, 774.
 Schwarz, 495, 572, 711.
 Scott, 92.
 Scrini, 82, 463.
 Seggel, 705.
 Sempe, 475.
 Shiele, 491.
 Singer, 139.
 Skorjuchow, 699.
 Smith, Priestly, 642.
 Snell, 102, 522.
 Snellen, 176.
 Sommer, 701.
 Sourdille, 460.

 Spataro, 168.
 Speciale-Cirincione, 477.
 Spiegelhoff, 150.
 Spiller, 525.
 Standish, 127.
 Starkey, 538.
 Starr, 91.
 Stephenson, 122, 289, 515, 544.
 Stern, 703.
 Stevens, Geo. T., 642.
 Stieren, 503.
 Stilvark, 730.
 Stirling, 273.
 Stocke, 721.
 Stoek, 492.
 Stood, 328.
 Straub, 184.
 Strebel, 708.
 Suker, 51, 666.
 Sulzer, 468.
 Sueskind, 254.
 Suter, 770.
 Swanzy, 767.
 Snyderacker, 225, 279.

 Takenousti, 369.
 Tauge, 185.
 Taylor, 441.
 Terrien, 76.
 Terson, 73, 478.
 Thilliez, 462.
 Thorner, 145.

 Topolanski, 159.
 Tornatoba, 458.
 Trouseau, 342, 460.
 Truc, 681, 694.

 Uththoff, 779.

 Valois, 478.
 Valude, 683.
 Van Beuschoten, 665.
 Van Geuts, 264.
 Velez, 135.
 Verhoeff, 293, 502.

- Viau, 691.
 Viciano, 371.
 Villad, 340.
 Villard, 687.
 Vinsonhaler, 618.
 Visser, 716.
 Vollaro, 739.
 Von Ammon, 708.
 Von Arlt, 16., 693.
 Wahlfors, 488.
 Walsh, 289.
 Watson, 333.
 Weil, 729.
 Weis, 777.
 Wessely, 262.
 Westhoff, 190.
 Widmark, 84, 126, 142, 143.
 Wilder, 114.
 Williams, C. H., 660.
 Wing, 233.
 Wingenroth, 709.
 Winselmann, 460.
 Witherspoon, 670.
 Wokenius, 489.
 Wolff, 210.
 Wolfberg, 162.
 Wood, Casey, 542, 631.
 Woodruff, H. W., 217.
 Woodruff, T. A., 116.
 Wright, Jonathan, 215.
 Wright, John W., 663.
 Wright, R. A., 652.
 Worth, 764.
 Würdemann, 235, 581.
 Yamamoto, R., 172.
 Yamamoto, Y., 173.
 Yvert, 467.
 Zia, 253.
 Zimmermann, C., 446.
 Zimmermann, M. W., 539.

INDEX OF SUBJECTS FOR THE YEAR 1903. VOL. XII.

- Abduction, congenital, defects with refraction, 312.
 Abscess of brain, choked disc, 729.
 Accommodation, paralysis of, 260, 469.
 paralysis and paresis of, 666.
 Alcohol, germicidal action of, 529.
 Amaurosis, acute following infantile convulsions, 528.
 from mushroom poisoning, 346.
 in lead colic, 494.
 uremic, 361, 494.
 Amaurotic idiocy, 711.
 Amber-yellow glass, 654.
 Amblyopia and Amaurosis, from electric discharges, 69.
 from non-use, improvement of vision in, 321.
 from non-use, 511.
 functional or hysterical, 117.
 nicotine, 74.
 tobacco-alcohol, analysis of urine in, 656.
 toxic from coffee, 232.
 unilateral, quinine, 190.
 with slow recovery after cataract extraction, 510, 545.
 Ametropometer-Scheiner, 470.
 Anatomy and physiology, 778.
 Aniridia, congenital bilateral, 265.
 Anisocoria, 696.
 Ankylostomiasis, eye changes in, 701.
 Arcus senilis, pathologic anatomy of, 739.
 Argentum catarrh of new born, 494.
 Articular rheumatism, eye inflammation in, 703.
 Asepsis and prophylaxis in ophthalmology, 336.
 Associated movements of head and eyes, 95.
 Asthenopia, accommodative, of Donders, 405.
 dependent on neures-thenia and hysteria, 662.
 produced by frowning, 371.
 Astigmatic accommodation following homatropine and eserine, 718.
 Astigmatics, vision of, 468.
 Atrophic retinae, treatment of with retinal extract, 659.
 Bacteriology, reaction time of corrosive sublimate against bacteria, 530.
 Bandages, 158.
 Beri-beri, central scotoma in, 171, 173.
 Biographic clinics, 398.
 Binocular single vision, conservation of, 9.
 magnifier, 125.
 "Bird's foot" suture, open treatment for cataract, 746.
 Blepharitis, expression of lid margin in, 293.
 marginalis, 519.
 Blindness, bilateral, measles, 695.
 causes and prognosis of sudden, 665.
 complete, by necrosis of sphenoidal bone, 728.
 degrees and limits of, 681.
 from paraffin injection into nose, 638.
 in Egypt, 697.
 methyl-alcohol, 708.
 monocular, through hystero-trauma, 721.
 Book notices, 208, 393, 568, 764.
 Botulism, etiology and prophylaxis of, 145.
 Burn with caustic potash, 735.
 Carcinoma, epibulbar planum, 539.
 Cataract, anterior polar from acute iodism, 745.
 bottle finishers, 329.
 clinical lecture on art of extracting, 441.
 clinical statistics on un-complicated, 498.
 connection with goiter, 151.
 conching of, 64.
 hypotonia, excessive in extraction of, 136.
 intra-capsular irrigation in operations, 416.
 open treatment, "birds' foot" suture, 746.
 operating in presence of dacriocystitis, 163.

- post-operative treatment, 458.
senile, 258.
- Central vessels, embolism and thrombosis, 68.
- Cerebral tumor without choked disc, 151.
- Chalazion bacillus, 728.
- Choked disc, after operation for abscess of brain, 729.
operation for, 707.
- Cholorosis, Egyptian, eye disturbances in, 700.
- Chorioid, double coloboma of, 723.
metastatic carcinoma of, 307.
rupture of, 310.
- Cinchonine intoxication, 706.
- Clinoscope, 642.
- Collyria, oily, 82.
- Color blindness, necessity of use of color names in test for, 94.
blindness, signal test for, 661.
perception, 721.
perception, central, test for, 543.
perception, lantern test for, 660.
sense and color blindness in children, 743.
test, a practical, 92.
vision, theory of, 322.
- Congenital anomalies, 1.
- Conjunctiva, cysts of, 496.
dermo-lipoma of, 135.
epithelioma of, 690.
papillomata of the cornea and, 435.
streptococcic infections of, 688.
tuberculosis of, 427.
515, 544.
tumor of, 150.
vegetations of vernal recrudescence, 73.
- Conjunctivitis, blenorrhagic, 150.
contagious, 127.
following contagion from vaginal catarrh in a cow, 703.
kerato, provoked by toad, 135.
metastatic of gonorrheal origin, 158.
trachomatous, cupro-citrol in, 693.
vernal, 648.
- Consanguinity, 655.
- Cornea, elastic fibers in, 738.
endothelium, pathology of affections of, 493.
epithelium, detachment of, 123.
infections, with perforation of Descemet's membrane, 462.
infiltrations from exuberant conjunctivitis, 374.
method of examining anterior surface of, 122.
operative treatment of gonorrheal ulcerations, 702.
recurrent formation of vesicles, 328.
ring abscess of, 487.
rodent ulcer of, 364.
septic ulcer of, 145.
tattooing, 368.
traumatism of, 479.
zonular opacity of, 681.
- Cortex of brain, 773.
- Cramp of ciliary muscle, eye strain, 663.
- Crede's therapy, value of, 259.
- Cysticercus, differential diagnosis, 254.
in both eyes, 581.
subretinal, 478.
retrolenticular, 479.
- Cystotoxins and sympathetic ophthalmia, 658.
- Cysts, oily in orbital region, 78.
- Dacrioadenitis, acute, consecutive to small doses Potas. Iod., 71.
syphilitic, 79.
traumatic, 374.
- Dacriocystoblenorrhoea of new born, 260.
- Dangerous trades, 208.
- Death from wound of orbit, 168.
- Diabetes, myopia, 700.
- Ectropium, treatment of, 135.
proper division of skin flaps in operation for, 535.
statistics operation, 149.
modification of Panas operation, 462.
operation for cicatrices of lower lid, 276.
- Electroscope, 80.
- Embolism, central artery and blindness following paraffin injection into nose, 638.
- Encyclopedia, 572.
- Epidemic eye diseases in school, management of, 253.
- Epithelioma of the conjunctiva, 690.
- Epiphora in babies, 251.
- Erythroptosis, 187.
- Examination of vision and color perception of 4698 railroad men, 55.
- Exophthalmus, due to bony growth in orbit, 744.
intermittent and varicose vein, 150.
in tumor of the orbit, 694.
pulsating cure by ligation of common carotid, 235.
unilateral transient, 161.
- Eye-ball, cervical sympathetic influence on, 154.
conditions requiring enucleation, 509.
contusion of and consequent effect on iris and lens, 359.
- Eye glasses, yellow, for shooting, 483.
inflammations, role of toxins in, 130.
injuries from chemicals, 485.
injuries, with introduction of non-magnetizable foreign substance, 239.
localization of endogenous injuries of, 492.
method of suturing tendons to form better stump after enucleation of, 102.
mode of excision to secure greater motility of stump, 101.
movements, 5 types of, 318.
prominence of and method for measuring, 666.
symptoms of diseases of pons and medulla, 490.
vasomotor, disturbance of, 109.
wounds of and law governing occupation accidents, 467.
complications of smallpox, 644.
strain, cramp of ciliary muscle, 663.

- Facial nerve, peripheral paralysis of, 495.
 Filaria in the vitreous, 707.
 Foreign bodies in eye-localization, 641.
 in orbit, 643.
 Fracture of base of skull-neurological and medico-legal considerations, 531.
 Frontal sinus, ophthalmic surgery of, 683.
 Fusiou tubes, 669.
 General diseases and visual organ, 211.
 Glaucoma, 488.
 cause of primary, 141.
 emotional, 342.
 etiology and treatment, 112.
 infantile treatment of, 168.
 in which adrenalin produced increased tension, 524.
 new surgical treatment, 114.
 retinitis pigmentosa, 777.
 with acute iritis following extraction of cataract, 246.
 Glioma and Pseudoglioma, 268, 298, 303.
 Goiter, exophthalmic, 466.
 surgical treatment of, 505.
 Gonococcus, coloring after Pappenheim, 266.
 Grave's disease, operative treatment of, 679.
 Hand book diseases of eye, 767.
 Hay fever, diseases of the eye, 698.
 Hemeralopia, liver preparations in, 161.
 Hemorrhages, essential intraocular, 463.
 Heredity, influence of, 654.
 Herman von Helmholtz, 214, 568.
 Heterophoria, principals controlling operative interference, 103.
 principals controlling non-operative interference, 104.
 Hungarian contributions, 774.
 Hysteria, rare eye symptoms in, 175.
 Injuries from lightning, 251.
 of eye by gun shot, 776.
 of posterior capsule, healing process in, 707.
 Intraocular tumors, 181.
 Intravenous injections of cyanide of mercury, 692.
 Iodism, producing anterior polar cataract, 745.
 Iridectomy in iridochorioiditis, 708.
 Iris, foreign bodies in, 371.
 gumma with punctate retinitis, 171.
 indirect ruptures of, 315.
 Iritis, tubercular, 158, 167, 360.
 Jubilee edition, 779.
 Keratitis, disciformis, 704.
 hypopion, 124.
 ichthyol in, 739.
 interstitial specific, 363.
 parenchymatous, 82.
 Knife testing, 642.
 Korynea bacteria, 728.
 Kinescopy, 472.
 Lacrimal canalculus, actinomycosis of, 80.
 gland, tumors and pseudo tumors of, 686.
 passages, surgical treatment of, 678.
 passages, syphilis of, 79.
 sac extirpation in laboring class, 254.
 sac extirpation of, 67, 342.
 sac epiphora after removal, 160.
 Lantern test for color blindness, 661.
 for color perception, 660.
 Lavage in ophthalmia neonatorum, 741.
 Lens, depression of, 527.
 disappearance of opacities of, 120.
 growing together of cornea and, 178.
 luxation, treatment of, 179.
 treatment of congenital dislocation by discision, 711.
 Lenses, decentering for near work, 107.
 Leprosy of the eye, 579.
 Leukemia, histological changes of retina and choroid in, 707.
 Lids, benign neoplasms of free border, 75.
 carcinoma of, 479.
 gangrene, 172.
 spasmodic retraction of upper, 476.
 transparent cysts of, 469.
 xanthelasma of, 687.
 Lightning, causing changes in the eye, 730.
 Light therapy, 708.
 Magnet, 152, 155, 159, 281.
 Manual, 784.
 Materia medica and therapeutics, 484.
 adrenalin, 339, 369, 484.
 argyrol, 480.
 atropine, 484.
 blennorrhoeal secretion, 174.
 bromide of methyl-atropine, 79, 155.
 brucine, 699.
 cantharides, 259.
 cocaine, 256.
 collargol, 480.
 copper citrate in trachoma, 652.
 enproctrol, 235, 693.
 dionin, 81, 160, 162, 170.
 electric heat, 81.
 eserine, 718.
 eumydrine, 702.
 fluorescin, 483.
 hetol, 82, 157, 256.
 homatropine, 718.
 ichthyol, 739.
 iodipin, 697, 700.
 iodoform in anterior chamber, 617.
 jequiritol, 341, 358, 542.
 jequirity, 82.
 liver preparations, 181.
 mercury, bichloride of, 690.
 mercury citrate ethylenediamine, 153.
 mercury cyanide, 692.
 methylene blue, 252.
 mydriatic drugs, 325.
 new remedies, 548.
 ophthalmol Lindemann, 357.
 paraffin, 51, 283, 461.
 pilocarpine, 116.
 potassium iodide, 81.
 potassium permanganate, 691.

- protargol, 80, 158.
 retinal extracts, 659.
 Roux serum, 459.
 salt sugar solution, 639.
 salt solution, 120.
 scopolamine, 485, 698.
 sodium iodide, 491.
 sodium salicylate, 131, 327.
 spiritus saponatus, 142.
 subconjunctival injections, 262.
 sublamine, 152, 153.
 suggestive therapeutics, 184.
 suprarenin muriate, 697.
 tuberculin, 153, 263.
 vaseline injections, 159.
 X-ray, 515, 544.
 yohimbin, 485.
- Measles, bilateral blindness, 695.
 Medical microscopy, 403.
 Mental derangement in eye hospitals, 674.
 Methods of examination, 573.
 Methyl-alcohol, toxicity of, 57.
 Micro-organisms found in conjunctival sac, 129.
 Microphthalmus, 338.
 Morbus Barlowii, 725.
 Mounting macroscopic eye specimens, 338.
 Mucocoele, bilateral of ethmoidal labryrith, 152.
 Muscae volitantes, 727.
 Muscles, about eye in facial expression, 183.
 anatomy of, 100.
 congenital absence of both inferior recti, 503.
 new eye, 181.
 operation on tendon of sup. rect. for paresis of sup. obliq., 280.
 papillar optici, 266.
 paralysis of sup. obliq. from trepanning frontal sinus, 372.
 physiology of ocular, 97.
 surgical intervention in paralysis of ocular, 337.
 syphilitic inflammation of external ocular, 258.
 tendinous shortening by strangulation, 137.
 traumatic paralysis of two superior obliques, 66.
- Mydriatic, use of after forty-five, 538.
 Myopia and diabetes, 700.
 caused by diabetes mellitus, 730.
 complete correction of, 722.
 etiology of, 84, 143.
 frequency of spontaneous retinal detachment, 252.
 full correction of, 89, 485.
 genesis and treatment of, 87.
 operative treatment of, 636.
 rapid operative treatment of high grade, 736.
 removal of lens in, 253.
 treatment of, 72, 162, 316.
- Naevus pigmentosus of conjunct. and cornea, 262.
- New method of preventing infection from conjunct. in operations opening anterior chamber, 508.
- News items, 191, 376, 553, 749.
- Nystagmus retractorius, 481.
- Ocular affections, influence of marine climate and saline baths, 479.
 affections in spinal lymphocytosis, 685.
 autoplastics, 70.
 carcinoma, 186.
 complications in fractured cranium, 370.
 complications in variola, 500.
 conservative surgery, 458.
 globe, partial ablation of, 685.
 palsies, 212.
 therapeutics, 578, 773.
 therapeutics, medical dosage in, 460.
 traumatism, unusual forms, 273.
 tumors, casuistics, 147.
- Oculomotor nerve paralysis, complete, 477.
- Operations, 213.
- Ophthalmia, congenital purulent, 63.
 Egyptian, 343.
 gonorrheal, adhesion between cornea and conjct. following, 259.
 neonatorum, 546, 547.
 neonatorum, etiology of and obligatory declaration, 684.
 neonatorum, lavage in, 741.
 purulent, in Egypt, 464.
 purulent treatment by potassium permanganate, 691.
 purulent metastatic, 446.
 purulent, streptococcus, 459.
 vaccine, 172.
- Ophthalmogonorrheal eye baths, 714.
- Ophthalmology, encyclopaedia of, 210.
- Ophthalmoplegia, bilateral internal, 466.
 progressive, 461.
 recurrent of third nerve, 166.
 total peripheral, 467.
 unilateral from vascular lesions, 73.
- Optic disc, hyaline bodies in, 311.
 disc, new formation of connective tissue in, 147.
 intravaginal hemorrhage, 468.
 nerve, atrophy, 81, 154.
 nerve, rupture of, 731.
 neuritis, hereditary retrobulbar, 151.
 primary extradural tumors, 316.
- Optometric type, comparative value, 734.
- Orbit, lymphadenoma of, 466.
 operation to enlarge contracted socket, 534.
 tumor of, 614.
- Orbital phlegmon, following empyema of the maxillary sinus, 713.
 tumors, symmetrical, 704.
- Paludism and detachment of the retina, 689.
- Pannus totalis, healed by inoculation with blennorrheal secretion, 174.
- Panophthalmitis in typhoid fever, 466.
- Papillitis and cerebral tumors, 469.
- Paraffin, cosmetic value of, 637.
 injection into nose followed by blindness from embolism of central artery of retina, 638.

- use in formation of stump after enucleation, 51, 255, 461.
- Paralysis of fourth nerve from trauma, 373.
of the sixth pair cranial traumatism, 680.
- Pathologic histology, 401.
- Perimeter, electric, 507.
new portable, 670.
- Peritomy, 522.
- Photography of fundus, 145, 149.
with nature's lenses, 333.
- Photophobia, pain in, 486.
- Phototropism, 570.
- Physicians visiting list, 402.
- Physiological optics, 772.
- Physiologic therapeutics, 576.
- Prosthesis, injection of fat, 135, 734.
- Pterygium, as diagnostic evidence of alcoholism, 1.5,
malignant with relapses, 74.
- Ptosis, congenital, 74.
operation, 364, 460.
- Pupil, dilatation of, 711.
- Red purple, function of, 723.
- Refraction and motility of eye, 770.
anomalies of, 213.
artificial eye in teaching, 366.
changes, 505.
connection between and illumination, 270.
- Report of State Hospital at Laibach, 263.
- Retina, anomalous direction of vessels of, 225.
angioid streaks in, 513.
changes in mental diseases, 489.
detachment of and paludism, 680.
detachment, treatment of, 82, 120, 138, 493, 552.
experimental lesions of, 118.
field, direct control of, 420.
hemorrhage as a diagnostic feature in fracture of base, 517.
obstruction of the vessels, 472.
- Retinal perception of single cone, 723.
- Retinitis, albuminuric, 156.
cachecticorum from carcinoma, 173.
circinate, 305.
pigmentary with zonular scotoma, 344.
pigmentosa and glaucoma, 777.
sympathetic choroid, 367.
- Retrobulbar abscess, 271.
- Rheumatic conditions in organs of special sense, 275.
- Roentgen photographs, 180.
- Sarcoma, developing in stump of eye of an infant, 474.
primary epibulbar, 293.
primary of the cornea, 475.
- Sclera in panophthalmitis, 491.
- Scotoma, colored, 341.
scintillans and migraine, 143.
treatment of scintillating, 67.
- Scurvy affections of the eye, 729.
- Section of eye substitute for enucleation, 274.
- Siderophone, 126.
- Signal test for color blindness, 661.
- Sinusitis, frontal and ethmoidal and their orbital complications, 140.
- osteoplastic operations for, 146.
- Skiascopy, 210, 662.
- Smallpox, eye complications, 644.
- Spectacles and eye glasses, 402.
- Spinal lymphocytosis and ocular affections, 685.
- Sprig catarrh, 393.
- Squint, 764.
- Staphyloma, treatment of recent by lens extraction, 342.
- Strabismus, 176-188.
fusion tubes in, 639.
method of determining degree of deviation in, 133.
muscular-capsular advancement in, 480.
non-operative treatment of, 106.
principles controlling operative interference in, 104.
ultimate effect of the operation, 716.
- Streptococcal infection of conjunctiva, 688.
- Subconjunctival injections, 640.
injections of iodipin, 697, 700.
medication, 639.
- Sub-enucleation, 685.
- Suppuration, iodoform into anterior chamber, 647.
- Surgical anatomy, 396.
emergencies, 575.
- Symblepharon, congenital with coloboma of lid, 71.
method of preventing after burns, 279.
skin grafting in, 217.
- Sympathetic ophthalmia, 709.
cystotoxins and, 658.
history of theory of, 110, 257.
two cases of, 478.
- Sympathetic ophthalmitis, chronic infections, 677.
- Sympathectomy, 713.
- Tabs, symptomatology, 317.
- Tarsorrhaphy, new method, 350.
- Tear secretion, congenital lack of, 701.
- Test card and letters, modified form of, 91.
- Therapeutics, ocular, 578.
physiologic, 576.
X-ray, 691.
- Thesaurus, 771.
- Ties of the eyes, 471.
- Trachoma, clinical study, 169.
cuprocitrol in, 255.
exsection of tarsal cartilage in, 631.
in Cairo, 372.
in Egypt, 464.
pathogenesis of, 167.
subtropical, copper citrate in, 652.
treatment of, 652.
X-ray in, 289.
- Traumatic nuclear ocular muscle paralysis, 712.
- Traumatism of eye and keratoconus, 72.
- Treatise, eye, nose, throat, ear, 215.
- Trichiasis by adiposus of the lid, 462.
operation for total and partial, 478.
- Tuberculosis of eye, 777.
- Tuberculous panophthalmitis in puperal states, 155.
- Tumors and pseudo tumors of the

- lacrimal gland, 686.
 Typhoid fever, panophthalmitis in, 646
 Uveitis, pathology of, 114.
 treatment of 116.
 treatment of by pilocarpine sweat baths, 116.
 Vena optociliaris, 264.
 Venereal disease, importance in etiology of blindness, 142.
 Vernal catarrh, 70, 137.
 conjunctivitis, 648.
 Visimeter, 141.
 Vision, an important factor in educational process, 331.
 intermittent colored, 460.
 loss of from observing an eclipse, 461.
 simple test for stereoscopic, 502.
 stereoscopic, 720.
 Visual acuity determination of, 474.
 disturbances after hemorrhages, 139
 disturbances of electric origin, 76.
 prognosis, 76.
 field, simulation of concentric contraction in, 476.
 Vitreous body, origin of in vertebrates, 459.
 body, regeneration of 339.
 development of, 572.
 filaria in human, 366, 707.
 plastic artificial in Mules' operation, 285.
 Xanthelasma, 687.
 treatment of by electrolysis, 340.
 X-ray in ophthalmic surgery, 287, 289, 515, 544.
 in ocular therapeutics, 691.
 study of in ocular therapeutics, 693.
 Year book, 393,
 Zona opthalmica with paralysis of 3rd nerve, 373.

INDEX OF BOOK REVIEWS FOR THE YEAR 1903. VOL. XII.

- AMERICAN Year Book of Medicine and Surgery, 393.
 Aschheim, H., "Special and general observations on tuberculosis of the eye," 777.
 Axenfeld & Unthoff, "Jubilee Edition in honor of Dr. W. Manz and Prof. Dr. H. Sattler," 779.
 BARTON, WILFRED, M., "A thesaurus of medical words and phrases," 771.
 Bernheimer, St., "Etiology and morbid anatomy of the ocular palsies," 212.
 Bothen, Lyder, "Leprosy of the eye," 579.
 CAJAL, RAMOND Y., "Studies on the cortex of the human brain," 773.
 Cohen, S. Solis, "System of physiologic therapeutics," 576.
 DANVERS, H., "Spring catarrh of the eyes," 393.
 Darier, A., "Ocular therapeutics," 578;
 Deaver, John B., "Surgical anatomy," 396.
 GINSBERG, S., "Pathologic histology of the eye," 401.
 Gould, Geo. M., "Bibliographic clinics," 398.
 Groenouw, A., "Relation of general and organic diseases to changes and affections of the visual organ," 211.
 HANKE, VICTOR, "Ocular therapeutics," 773.
 Hegg, Emil, "Stereoscopic pictures for squinting persons," 209.
 Hess, Carl, "Anomalies of refraction and accommodation with introductory exposition of dioptries of the eye," 213.
 KOENIG, ARTHUR, "Collected essays on physiological optics," 772.
 Koenigsberger, Leo, "Herman von Helmholtz," 214, 568.
 LANDOLT, EDMUND, "Methods of examination," 573.
 Leber, Th., "Anatomy and physiology of the circulation and nutrition of the eye," 778.
 Lenhossek, M. von, "Development of the vitreous body," 572.
 Lindenmeyer, G., "Injuries of the eye by gun shot," 776.
 MAY, CHAS. H., "Manual of the diseases of the eye for students and general practitioners," 784.
 OERTEL, T. E., "Medical microscopy," 403.
 Oliver, Thomas, "Dangerous trades," 208.
 PHILLIPS, R. J., "Spectacles and eye glasses," 402.
 Physicians visiting list, 402.
 Posey and Wright, "A treatise on diseases of the eye, nose, throat and ear," 215.
 RADL, EM., "Investigations on the phototropismus of animals," 570.
 SCHULEK, W., "Hungarian contributions to ophthalmology," 774.
 Schwartz, O., "Encyclopedia of ophthalmology," 210, 572.
 Snellen, H., "Operations on the eye," 213.
 Suter, Wm. N., "The refraction and motility of the eye for students and practitioners," 770.
 Swanzy, Henry M., "A handbook of the diseases of the eye and their treatment," 767.
 WEIS, EDWARD, "Retinitis pigmentosa and glaucoma," 777.
 Wolf, Hugo, "On the theory of skiagraphy," 210.
 Worth, Claud, "Squint; its causes, pathology and treatment," 764.

THE ANNALS OF OPHTHALMOLOGY.

VOL. XII.

JANUARY, 1903.

No. 1.

REPORT OF TWO CASES OF CONGENITAL ANOMALIES OF THE EYES, ILLUSTRATING THE TRANSMISSION OF SUCH DEFECTS FROM MOTHER TO DAUGHTER.*

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ILLUSTRATED.

Case 1. Mrs. K. J., aet. 57 years, came to my service at the Howard Hospital in April last, for improvement of vision and relief from asthenopic symptoms. Inspection revealed typical coloboma of the iris in both eyes. As shown by the accompanying sketch, the apex of the coloboma in each eye was down and in, about 10° from vertical meridan. The coloboma was not perfect in either eye, the ring-like structure of the iris being completed by a narrow rim of tissue between the limbus and the pupillary margin. There were curious wart-like growths on the upper and lower lids of the right eye at the outer canthus, but these were probably merely coincidental and without significance in connection with the changes in the eyeball. The corneæ were ovoid in each eye, the axes corresponding to that of the pupil.

In harmony with the defects in the iris, the ophthalmoscope revealed colobomatous formations in the interior of

*Read before the Ophthalmological Section of the College of Physicians, Philadelphia, November 18, 1902.

both eyes, those in the right being unusually complete, involving the entire head of the nerve, and forming a deep cleft in the chorioid. As is well shown in the accompanying figure, the top of the coloboma corresponded to the upper edge of the optic nerve. In this portion the ectasia had a depth of about 15 dioptries, the fundus just above it being

Right eye.

Left eye.

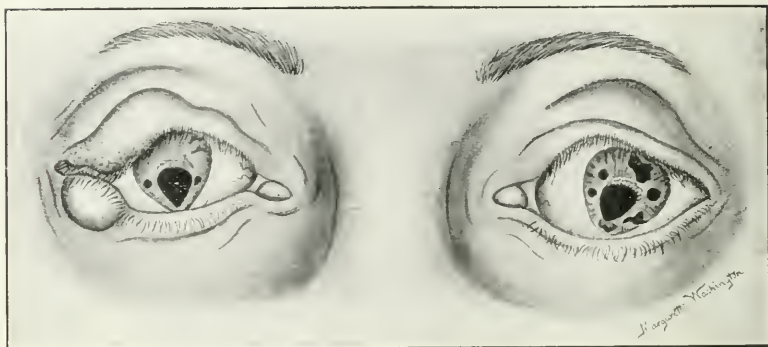


Fig. 1. Case I.

Right eye.

Left eye.

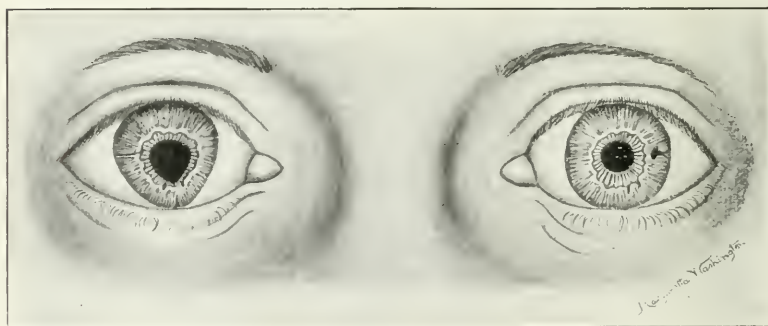


Fig. 3. Case II.

seen with a convex lens of 5 D., while concave lens of 10 D. strength was required to outline its bottom. It was about 5 discs diameter broad, and this breadth was maintained throughout, the coloboma not broadening toward its base as is the usual custom. The coloboma was not of uniform depth, but as it is well illustrated in the drawing, there were three distinct ectasia, a superior, corresponding to the

excavation in the optic nerve, and two inferior in the chorioid of much the same size and form. A few retinal and chorioidal vessels coursed over the coloboma, and were lost to view before emerging over their edges. The

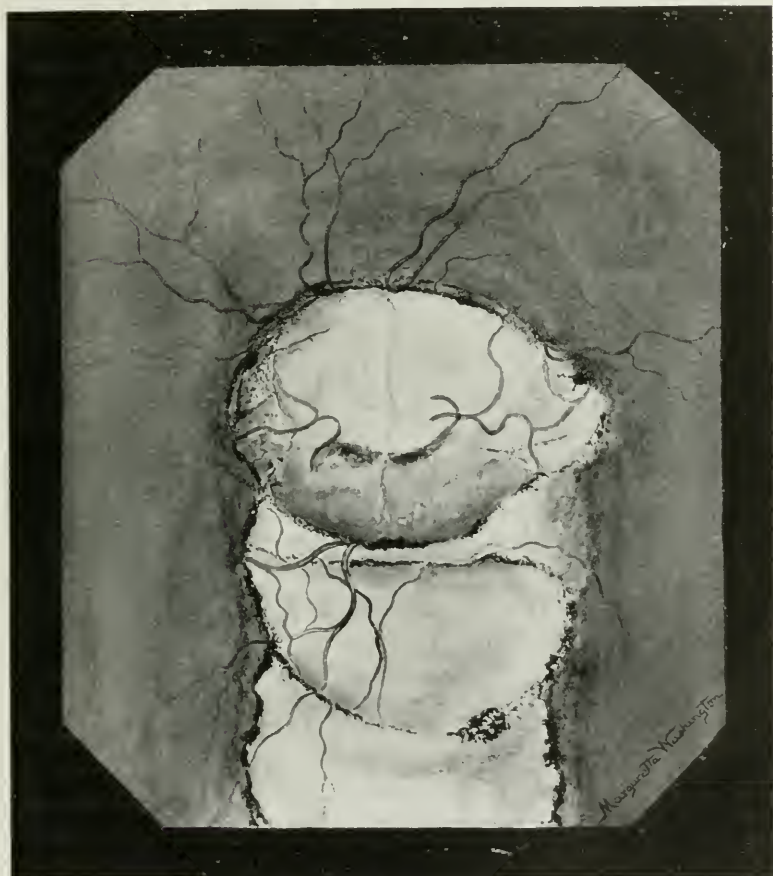
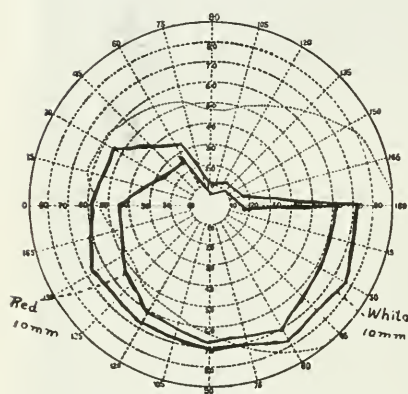


Fig. 2. Case I. Right eye.

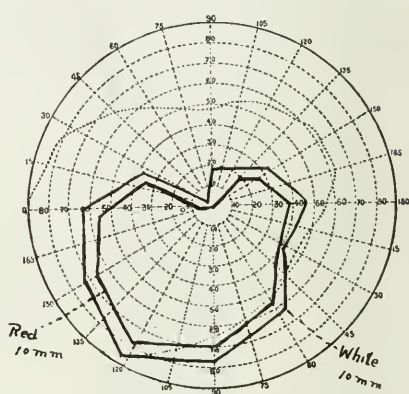
bottom of the coloboma was glistening white, being bereft of pigment or tissue save at its edges. The macular region and the fundus elsewhere appeared healthy.

The left eye had suffered much less, the nerve escaping, save for a small cup shaped depression at the lower outer

margin,* the chorioid was but little affected, the coloboma beginning about 2 disc diameters below the disc and extending but about 10 disc diameters inferiorly. The ectasia was oval with undermined edges, deepest above, and was bounded with irregular shaped pigment masses. The vessels stopped at the edges of the coloboma and no vessels or tissue broke the glistening white scleral reflex of its bottom. The level of the fundus was seen with a convex 3 D. lens, the bottom of excavation with a concave 3 D. lens. Vision in the right eye equalled 5/70; in the left 5/50. The field showed a marked restriction in the upper part, being contracted almost to fixation; the fixation point in both eye was, however, unaffected.



Right eye.



Left eye.

Case I.

Case II. Mrs. S. S., aet. 23 years, daughter of Case I. This patient had never complained of her eyes but submitted herself to examination at request, when it was learned that she too had "queer looking" pupils. As is shown in the accompanying sketch, examination revealed the suggestion of a colobomatous shaped pupil in the right eye and a moderate degree of corectopia in the left. The cornea and pupil in the right eye were both ovoid, at an axis of 100° , in the left the cornea was ovoid at an axis of 90° , but the pupil was round and displaced slightly above.

*This corresponded precisely to the excavation in the head of the optic nerve, pictured by Szili in Fig. 5 of Plate III, in his monograph on the topography of the entrance of the optic nerve in the human eye.

The figure IV well depicts the ophthalmoscopic finding in the right eye, i. e., a moderate amount of absorption of the retinal epithelium with exposure of the chorioidal circulation and some irregular patches of pigment, in an area beginning at the lower level of the disc and extend-

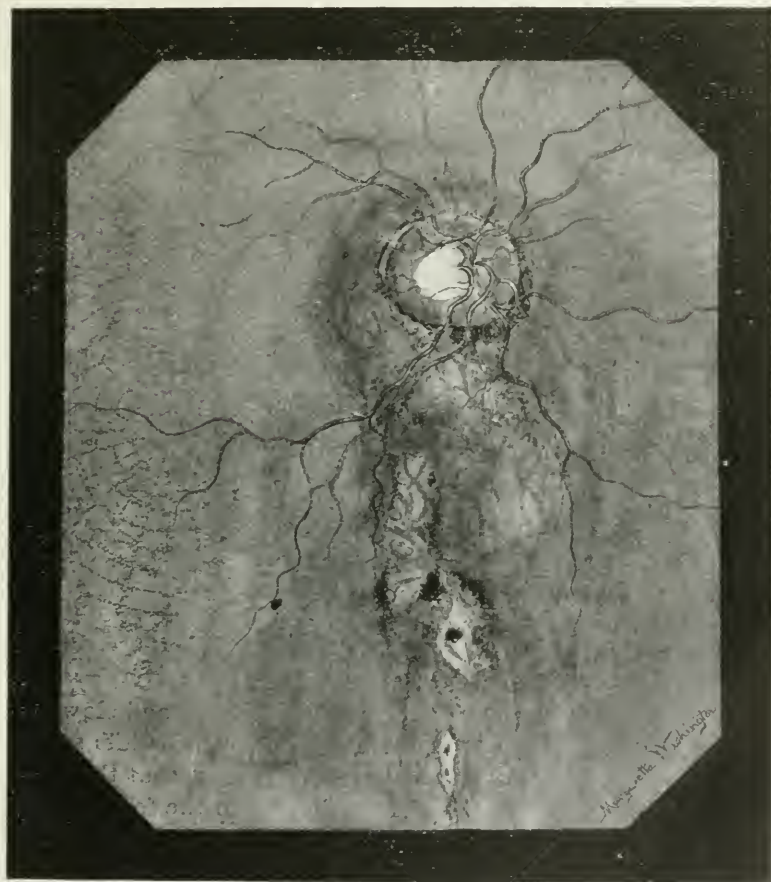


Fig. 4. Case II. Right eye.

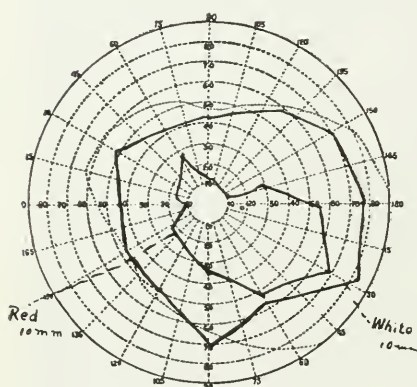
ing directly below to almost the periphery of the fundus. About 3 disc diameters below the disc there was an ectasia about 6 dioptries deep, with some chorioidal vessels crossing it.

The fundus of the left eye was normal. Vision in the right eye equalled $\frac{5}{4}$, in the left $\frac{5}{5}$. The field in the

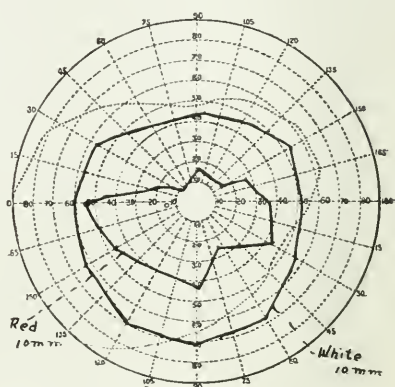
right eye was restricted for color superiorly, that of the left was normal.

My reason for presenting these cases to the Section is because they illustrate the transmission of anomalous conditions from parent to offspring; the chief point of interest, however, centers in the fact that the transmission was from a typical coloboma in the mother's eye to anomalous formations of lesser degree in the daughter's eyes, which are not usually recognized as having any connection with coloboma.

The mother presents the not very rare condition of coloboma of the iris, chorioid and optic nerve, the daughter a moderate degree of corectopia associated with certain



Right eye.



Left eye.

Case II.

disturbances in the chorioid in the median line below the nerve, which taken in conjunction with the coloboma of the chorioid in the mother's eyes, suggests that they too had resulted from an imperfect closure in the foetal cleft.

In explanation of the appearance of these anomalous conditions in the eyes of mother and daughter, and of the appearance of typical colobomatous formation in the eyes of one and of corectopia and certain chorioidal changes in the eyes of the other, I would like to call the attention of the Fellows to an article which I read before the Ophthalmological Section of the American Medical Association in June, 1897. In that paper I reported a series of cases presenting some unusual congenital defects of the iris, and dwelt at some length upon the genesis of con-

genital defects of the iris in general, advancing hypothesis that all anomalous conditions of the iris might be occasioned by the improper development of the vascular framework of the iris. I said that "the marginal portion of the secondary optic vesicle from which the iris springs, is essentially a vascular tissue, consisting of but little more than a net-work of blood-vessels, supported on a delicate connective tissue, which is derived from the endothelial layer and a few spindle cells from the anterior layer. The vessels are formed through the union of the long and anterior ciliary arteries, which anastomose to form the major circle of the iris. From this circle small branches are given off which run inwardly between the cornea and the lens, and represent the chief blood-vessels of the iris. Each of these vascular loops is surrounded with connective-tissue cells which become the stroma of the iris. These vascular twigs with the proliferating cells about them protrude into the anterior chamber and viewed at this stage would represent, to my mind, a segment quite analogous to those which have just been referred to,* and if the process of development stopped here, we would have an appearance similar to that noted in my first case, i. e., a number of more or less isolated roots or segments. Later a union of these segments occurs and the complete iris is formed, the ring-like character of the pupil being given it as a result of the peculiar arch-like form of the vessels after they unite to form the minor circle.

If these segments represent, as I believe, the proliferation of tissue around a twig of the major circle of the iris, and if the iris really grows in this manner, through a primary protrusion of these twigs, then the explanation of many forms of anomalies of the iris would be a simple matter, for we need only suppose an absence of one or more iridal capillaries to account for a defect in the membrane in any position or to any extent, and the occur-

*The iris in the case referred to was but rudimentary, being about 2 mm. wide in its broadest part. Under high magnification it was discovered that this ribbon-like ring of iris tissue was composed of one well developed and two smaller roots or segments which were crescentic in form and joined with one another to form a complete ring of iris tissue.

rence of the isolated segments which have been cited would be readily explained. Although this theory is hypothetical, all others which have been advanced to explain anomalies of the iris are also liable to the same reproach, for they are all founded upon clinical observation and insufficient microscopical proof.

By this theory the close phylogenetic relationship between coloboma and other anomalous conditions of the iris can be readily explained, a complete typical coloboma representing the absence of a main iridal branch, corectopia a slight irregularity in the proper distribution of one of the twigs.

THE CONSERVATION OF BINOCULAR SINGLE VISION.

BY EUGENE RICHARDS LEWIS, M. D.

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PART I. GENERAL CONSIDERATIONS.

In the United States alone between 1,500,000 and 2,000,000 persons lack binocular single vision.* Many of these apparently have two good eyes, normally related in position and movements, yet only one eye is used for seeing. In others of this number strabismus exists and is held responsible for the monocular vision. In still others such conditions as corneal opacities, pupillary membranes, lenticular and vitreous opacities, and many other demonstrable abnormalities, interfere with the vision of one eye and so limit the seeing power of the individual to the monocular type.

The lack of binocular single vision means a great *actual loss* to the individual, which may be better appreciated after a careful consideration of monocular and binocular single vision in comparison; and a greater *potential loss*, which will be better appreciated after considering those cases in whom loss of the seeing eye has been followed by blindness in spite of the fact that the remaining eye was apparently normal.

In a great many of these cases in which vision is of the monocular type the normal, binocular single vision, might be established by proper conservative measures adopted *early* in life.

Inasmuch as man is possessed of two organs of sight, each independently able to discharge visual functions, vision may be *monocular* or *binocular*.

Vision may be *single*, when a person sees an object *singly*; *double*—diplopia—when the observed object appears doubled; or *multiple*—polyopia—when it has the appearance of more than two objects.

*This is exclusive of those cases in whom one eye has been lost.

Monocular single vision occurs when one eye, independently of its fellow discharges the visual functions normally.

Monocular diplopia and *monocular polyopia* occur when one eye acts independently of its fellow under certain conditions of functional disturbance.*

***The cause of monocular diplopia is either anomalous refraction of the rays of light or the presence of a double pupillary opening. The former represents one form of irregular astigmatism, and has its seat either in the cornea or the lens (particularly in the case of subluxation of the lens). In incipient cataract also, monocular diplopia may develop as a result of the unequal refracting power of the different sectors of the lens. * * * A double pupillary opening produces diplopia when the eye is not adjusted for the distance at which the object of fixation is placed. It is most frequently found as a consequence of iridodialysis * * * "Monocular diplopia with double aperture (iridodialysis, perforation of the iris, division of the pupil into two parts by an opaque strand, etc.) takes place only when the eye is not properly focused; otherwise there is single vision even with a double pupil. This fact is accounted for by the well known experiment of Scheiner. Two holes are made in a piece of card board with a needle, the distance between them being somewhat less than the diameter of the pupil, so that, when looked through, both lie at the same time in front of the pupil. Through this apparatus we look at an object (as a tightly stretched thread) at a distance of 25 cm. If the eye is focused for this distance, all the rays emanating from the object are united upon the retina at a point. If now out of the cone of rays, only those are transmitted which pass through the two holes, these rays still unite to form an image at that point; the only change which this image undergoes by having the diaphragm placed before it is an enfeeblement of its luminosity due to the cutting off of many rays. But if the eye is not focused for the distance of the object, the apex of the cone of rays does not fall upon the retina, but falls behind it. The cone of rays is cut off in front of its apex by the retina, so that the image of the point is a disc (diffusion circle) and the point looks completely blurred. But if now only two bundles of rays out of the entire cone are admitted to the eye through the diaphragm, each one casts its own smaller diffusion circle. the point is now seen more distinctly, it is true, but is seen double. * * * In myopia especially of high degree the complaint is sometimes made of monocular diplopia. This makes itself particularly apparent when rectilinear outlines such as telegraph wires become objects of fixation they then appearing double." (Fuchs)

That monocular diplopia may be the result of disturbed cerebral function is shown by a case of E. B. Heckel's (Philada. Med. Jour. Mar. '00). A young married woman complained for a week of intense headache. Then for two consecutive days she had diplopia with the left eye. There was no error of refraction and no spasm of ciliary muscle—the usual explanation for monocular double vision. The author attributed it to "a sensory phenomenon of cerebral origin brought about by the toxins of typhoid fever." Malformation of the cornea, due to traumatism or other cause, may result in producing monocular diplopia.

Binocular single vision occurs when the two eyes are so co-ordinated as to discharge the visual functions in perfect harmony. *Binocular diplopia* and *binocular polyopia* occur when the two eyes are not so co-ordinated as to discharge the visual functions in perfect harmony.

In this connection should be mentioned the inutility of other than *single vision*. Diplopia and polyopia are attended with such confusion that the use of the eyes in scrutiny, for reading, writing, or any kind of near work, for any length of time is practically impossible.

With respect to varying degrees of perfection in the co-ordinated visual act, the writer prefers the following nomenclature:

1. *Monocular visual ability with monocular single vision*, being that state of visual activity in which all seeing is done by one eye because of the lack of visual activity in the other eye. This may be due to absence, disease, injury, or functional impairment of the other eye.

2. *Binocular visual ability without binocular single vision*, being that state of visual activity in which both eyes are capable of participating in the visual act, but in which perfect co-ordination does not exist. Alternating convergent strabismus is an example of binocular, yet imperfectly co-ordinated visual ability; *binocular*, but not *simultaneous binocular* visual ability exists. Esotropic diplopia is an example of this state; *binocular simultaneous* visual ability exists, but vision is not single because of imperfect co-ordination.

3. *Binocular visual ability with binocular single vision*, being that state of visual activity in which both eyes participate in the visual act simultaneously and single vision results.*

1. The only *congenital* attribute of vision is proper perception of light.

2. The visual act, either the binocular or the monocular

*Parinaud (Ann. d'Ophth. Jun. '96) divides vision into: 1. Binocular. 2. monocular, and 3, simultaneous. The last is distinguished from the second by identical projection of the same object by each eye. In squint binocular vision is present, but simultaneous binocular vision is absent. The image of the squinting eye falling upon a part of the retina dis-associated in function from that of the other, is suppressed.

lar, in the state of full development results from *learning* to make use of light perceptions; in other words, all other attributes of vision are *acquired* abilities.

3. The normal, binocular single vision, results when the visual act is *learned correctly*. In normal children about four years elapse before binocular single vision is established.

4. In the presence of some influence which interferes with learning correctly the child does not cease learning how to see, but *learns incorrectly*.

5. Such an influence may be exerted by any one of a variety of abnormal conditions, many of which are remediable. Correction of such as can be remedied removes this influence and renders it possible to *learn correctly*. The more firmly fixed the habit of *seeing incorrectly* becomes, the more difficult it is to *relearn the visual act correctly*, even though the causal influence be removed.

6. Differential diagnosis in regard to remediability of the causal condition is possible in nearly every case.

7. Excepting those cases which present irremediable obstacles to binocular visual ability, binocular single vision may be established in every case in which visual inco-ordination exists, *providing treatment is begun early enough*.

It has been estimated that one person in every ten in the United States is at some time subject to ocular trouble. Between 17 per cent. and 20 per cent. of these lack co-ordination of the eyes to such an extent that the only single vision obtainable is monocular. There are four classes in which monocular single vision is found:

1. Monocular single vision with strabismus and with visual incompetence.

2. Monocular single vision with strabismus and without visual incompetence.

3. Monocular single vision without strabismus and with visual incompetence.

4. Monocular single vision without strabismus and without visual incompetence.

The first class includes the majority of cases of strabismus, those in whom the deviating eye is found to be amblyopic to a greater or less degree.

The second class includes those cases of strabismus of the so called "alternating" type, in whom at one time one eye is used for seeing while the other deviates, at another time the second eye is used for seeing while the first deviates.

The third class includes: (a) cases of *so-called* "congenital" amblyopia, where no malposition of the eyes exists yet because of the incompetence of one the other has to do all the seeing: and (b) those cases in which, because of direct obstruction to light rays, such as opacities in the media, or because of congenital imperfections such as colobomata of the chorioid, retina, or optic nerve, or because of acquired imperfections such as optic nerve atrophies, or traumatic defects, the functions of the organ are impaired.

The fourth class includes those cases in whom no malposition or functional impairment exists, yet because of lack of co-ordination the binocular act is defective. Such cases may change into alternating strabismus by the onset of a deviation. They lack stereoscopic vision.

Aside from the greater value of binocular as compared with monocular single vision in orientation and sense of perspective, which will be discussed later on, there is an element of inestimable value to the individual in having the most important of all the special senses divided between two organs, each of which is individually competent to perform most of the functions which combine to make the sum total of visual abilities. One eye may be incapacitated by accident or disease, yet the utility of vision is so little impaired that the student can continue his studies, the artisan his craft, the professional man his profession, during the period of suspension of function in the injured or diseased organ.

Many such individuals whose only single vision is of the monocular type, early or late in life suffer impairment or loss of the vision of the better eye through traumatism or disease. Such impairment or loss is followed by varying results to the visual abilities of the individual. In some cases of strabismus, for instance, the eye which had formerly been unused rapidly improves in visual ability and successfully assumes the visual functions. Johnston (Jour. Amer. Med. Assn. Jan. 1894) reports such results

in two cases. In case I, the squinting eye formerly able to count fingers only, possessed itself of full normal visual acuity within ten days; in case II, the visual acuity of the squinting eye as tested immediately after the accident, was 20/70, not improved by glasses; four days later it had come up to full normal, and three months later with a full correcting lens it had still further improved, equalling 20/10. This patient was 30 years old. Unfortunately such improvement of vision in the poorer eye does not always occur. The results seen in the following cases are more frequently met with. Case III reported by Connor (Amblyopia from Suppression, Congenital Imperfection, or Disuse, Which or All?): Male, aet. 28 years, right eye injured Nov. 26, 1890. He and his friends said that the left eye always converged and that he never could see anything with it. * * * An examination of the squinting eye at the time of the accident and many times thereafter failed to detect disease of the optic nerve or any of the media, chorioid or retina. There was mere light perception at the periphery of the visual field. This perception did not increase to any appreciable degree nor had it done so when last seen three years after the accident." Worth (The Aetiology and Treatment of Convergent Squint) reports case IV, "boy, aet. six years, right eye enucleated; left eye squinted inward since two years old and fixation was lost. It is now four and one half years since the accident to the good eye and the enforced use of the amblyopic eye has produced no improvement. He can only count fingers at 8 feet." The writer reported two cases showing similar results. (Medicine Nov. 1902.) "Case V, Male aet. 9 years, right eye enucleated one year ago. Left eye squinted since one and one-half years of age. No improvement of vision has occurred in this eye since the loss of the right eye. Vision equals counting fingers at 2m." Case VI, Male, 33 years, hatter by trade, right eye enucleated three years ago after scissors injury. Left eye squinted first at age of three years but eventually returned to normal position as he became full grown. No improvement of the vision of the left eye has occurred since the loss of the right. He has been compelled to attend a school for the blind in order to learn a trade."

It is true that in cases of strabismus such improvement

in the visual acuity of the defective eye is sometimes seen. Similar improvement is more rarely seen in cases of non-strabismic amblyopia of the type under discussion, except in cases in which the enforced use of the amblyopic eye has occurred early in life. Two cases in physicians have recently come under the observation of the writer, illustrating the rule in regard to non-improvement of such cases after adult age has been reached. Case VII, male aet. 55 years, physician; at 14 years of age he noticed that he could not see with his right eye. Skiascopy shows this eye to be hypermetropic with astigmatism in an oblique axis. Vision equals counting fingers at 1 m. not improved by full correcting lens. Case VIII, male, aet. 58 years, physician; right eye amblyopic, never squinted. He says he never used this eye for seeing. Skiascopy shows moderate degree of mixed astigmatism; vision equals counting fingers at 2 m., slightly improved by a full correcting lens. No fundus changes could be demonstrated in either of these cases. Both men spoke of having gone through life in constant fear of losing the vision of the good eye, in which case they would have been left in a practically blind state.

The following case illustrates the better results seen in some of these non-strabismic cases, when the amblyopic eye is forced to assume the burden of vision early in life. Case IX, female, aet. 8 years; right eye amblyopic. With this eye she was able only to count fingers at 5 m. Measures were adopted with a view to preventing the better eye from any longer monopolizing the visual abilities and a full correcting lens was placed before the amblyopic eye. Improvement of the vision of the amblyopic eye was rapid, and as soon as simultaneous binocular visual ability was manifest, orthoptic exercises were instituted; after three months of conscientious work on the part of the patient and her mother, vision had come up to 6/VIII in the poorer eye and she was able to accomplish binocular single vision. Diplopia was noticed for a short time previous to the establishing of binocular single vision. Similar improvement has been noticed by Landolt, Javal, Parinaud, Worth and others, following the adoption of rational measures in early life.*

*In speaking of such results Worth says: "To get this potent quality of binocular vision orthoptic training must be carried out early, not much later than five years, at a time when the development of the fusion faculty should be normally taking place."

In order to attempt any systematic study of these cases with a view to understanding the conditions and principles which underlie the departures from the normal, it is necessary to study the normal—congenital, and developmental.

And what is the normal? Not only the laity, but a great many physicians are under the erroneous impression that if a pair of crossed eyes are straightened by an operation, this cure is all that could be desired and the trouble has been removed. In the normal not only must there exist proper relative positions of the two eyes and proper abilities of each eye to see, but the two eyes must be capable of such co-ordinate action as will accomplish binocular single vision. Refractive errors may be such as to prevent clear appreciation of objects scrutinized, but if, with both eyes visually active, the brain remains conscious of but one single image, no matter how indistinct the image may be, these eyes represent the normal with which we are to deal. Refractive errors may be wanting, allowing absolutely clear appreciation of objects scrutinized by each eye individually, but if these eyes are not capable of simultaneous visual activity, or if the result of such simultaneous visual activity is other than the consciousness in the brain of one single image of the object, these eyes represent departures from the normal with which we are to deal. The normal is *binocular single vision*, and any condition of vision representing lack of this *binocular single* quality represents departure from the normal—whether there be lack of parallelism of the eyes or not, amblyopic defect of one or both eyes or not, refractive error of one or both eyes or not, or any or none of the possible combinations of these.

Instances of departure from the condition of emmetropia are of such exceedingly common occurrence as to make emmetropia of interest on account of its rarity. The range of these refractive errors includes variations of all degrees, from slight hypermetropic error of one eye to extreme mixed astigmatism of both eyes. Of such refractive errors even the extreme degrees are not incompatible with binocular single vision, although the visual acuity may be of low grade.

There is another class of cases in which the accomplish-

ing of binocular single vision is more or less difficult. These are dependent upon a variety of conditions of the extra-ocular muscles, embracing absolute or relative weakness, excessive strength, or erroneous insertion of certain of these muscles, any of the various states embraced in the term "muscular inbalance." There are the so-called "phorias," exophoria, cyclophoria, esophoria, and hyperphoria, and their combinations. They represent conditions transitional between those compatible and those incompatible with binocular single vision.

There are in the third place, a large number of conditions which are absolutely incompatible with binocular single vision. In some of these conditions one eye only is used for vision. This is the case where the other eye is incompetent, either as a result of traumatism or disease, or because any of a large number of conditions coming under that all-embracing term "functional defect." In others of these conditions each eye is visually competent, one being brought into use at one time, the other at another time, but lack of coördination renders simultaneous use of both eyes impossible. In some of these cases single vision is obtained only by covering one of the eyes, diplopia existing when both are allowed to observe at the same time.

What accounts for such widely differing results in regard to the vision of the poorer eye after the loss of the vision of the better eye, in cases of apparently similar defect?

That it is not wholly a question of the age at which such loss occurs is proved by comparison of the results in cases III and VI with those in cases IV and V. In cases IV and V no improvement of vision followed the enforced use of the poorer eye only, although this use was enforced early in life. That it is not wholly a question of deviation of the poorer eye is proved by comparison of the results in cases I and II with that in case VI.

That question has been approached in various ways. In this connection Holthouse says: "Dividing the muscle by which the strabismus is produced not only rectifies the malposition of the eye but improves its vision.*"

*And this author reports cases in which he states that such procedure improved the vision not only of the eye operated upon, *but also of its fellow*. (On Squinting, Paralytic Affections of the Eye, and Certain Forms of Impaired Vision. 1858.)

Careful study of the cases he reports cannot fail to suggest that, had he used the tests of to-day in measuring the visual acuity before and after operation, this improvement would have been found to be much less than he reported. Holthouse believed that the extra-ocular muscles played quite an important part in regulating the clearness of the retinal image, their influence being felt in the various degrees of compression of the globe resulting from contraction of the muscles.

J. Reboud* shows that the extra-ocular muscles do not contribute to accommodation.

Sattler† finds there is no difference in the refraction of the eye between convergent and parallel positions of the visual axes, whether in the horizontal plane or not, providing the ciliary muscle is paralyzed or the eye aphakic.

Donders‡ believed hypermetropia to be the direct cause of strabismus, and acknowledged his ignorance on the subject of non-toxic amblyopia, saying: "Accuracy of vision is imperfect either in one or both eyes. This is in part attributable to astigmatism, in part to a still unknown imperfection of the retina."

Von Gräfe§ believed that on account of error of development or congenital imperfection, the image in the affected eye fell on points not functionally co-related and that, on account of the resulting diplopic confusion, suppression of the vision of that eye occurred, and subsequently amblyopia ex anopsia developed in direct consequence of the suppression. (He also says that the bringing about of an approximately correct position of the eyes by means of operation is indicated for two reasons; first, in order that the suppressed visual action of the deviating eye may be brought into use again as this is lessened by eccentricity of the retinal image; and second, because the visual power will be increased and through these two effects the sensory value of the retinal image will be raised. In a note he adds that the maxim to wait until the intelligence of the child has developed and the sense of

*Reboud. Arch. d'Oph., Nov., '94.

†Sattler. Gräfe's Archiv. f. Opth., Vol. XI.

‡Donders. Accommodation and Refraction of the Eye, 1864.

§Von Gräfe. Archiv. f. Ophth. 1857., No. 2, p. 223.

beauty awakened, is wholly wrong. Without intelligence and sense of beauty more will be accomplished under all circumstances with good visual power than when the latter is absent.)

Segual* believes that amblyopia develops in direct consequence of disuse.

N. Violet and Johnson† voice similar belief.

Stilling‡ asserts: "The cause of squint is not hyperopia, but the position of rest usually associated with hypermetropia, viz., convergence."

Gardiner§ disagrees with Stilling in regard to the facts upon which he bases his theory.

Marlow|| also disagrees with Stilling in this regard and substantiates his claims by the report of 191 cases in whom the position of rest was examined.

Hansen-Grut¶ takes issue with Stilling on this ground; he finds the position of rest of the eyes to be divergence, a finding with which Bjelow agrees.

Bjelow¹ completely disproves Stilling's statement that when a distant object is fixed, the covered eye remains in a position of rest; and he is convinced from his investigations that the position of rest of all eyes is divergence.

S. Snell² regards strabismus as standing in direct relation to hypermetropia.

Burnett³ observes that strabismus is twelve times more frequent in the white race than in the negro. As he finds no greater ametropia he is inclined to attribute this greater frequency to a firmly fixed habit of convergence among the whites. Until a few years ago the negro has never had to use his eyes for near work, whereas the white man has been doing it for generations.

*Segual. *Archiv. d'Ophth.*, July, 1895.

†Violet. *Arch d'Ophth.*, Vol. M., 4.

Johnson. *Trans. Am. Ophth., Soc.*, 1895.

‡Stilling. *Archiv. of Ophth.*, Vol. XV., No. 3.

§Gardiner. *Archiv. of Ophth.*, Vol. XVI., p. 39.

||Marlow. *Ophth. Rev.*, Vol. VIII, p. 39.

¶Hansen-Grut. *Trans. Ophth., Soc.* 1888-89, Vol. IX.

¹Bjelow. *Wjestnik. Ophth.* 1887, Nos. 3, 4, 5.

²S. Snell. *Brit. Med. Jour.* 1887, No. 1395, p. 657.

³Burnett. *N. Y. Med. Rev.*, Nov. 12, 1887.

Naumoff* calls attention to changes in the fundus of new born children, which he believes to be of great importance in considering the etiology of strabismus and so-called "congenital" amblyopia. Königstein, Schliech and Bjerum also call attention to injuries received during birth and their effect on vision.

Steffan† takes issue with the suppression theory of von Graefe, saying: "The theory that amblyopia of the deviating eye depends on lack of use is no longer tenable. If it were true, the degree of amblyopia would be proportional to the degree of strabismus, but this is not at all the case; on the contrary, we find the highest degree of amblyopia coincident with the beginning of a squint, and a very good acuteness of vision associated with a unilateral strabismus of long standing." Steffan agrees with Naumoff in attaching great importance to fundus changes found in the new born.

Connor says:‡ "There is no positive evidence of the existence of amblyopia from suppression," and goes on to say "there is a class of cases in which congenital amblyopia is still farther crippled by disuse."

Kunn|| says that the factors contributing to strabismus are the orbit, globes, muscles, and innervation, and that amblyopia is never a consequence, but often a cause of squint.

In 1838 Stromeayer temotomized cadavers and satisfied himself that strabismus might be cured by such procedure. In 1839 Dieffenbach began a long series of tenotomies in the living for the cure of strabismus. Guerin was the first to operate by advancing the weaker muscle, in the early part of the following decade. The names of von Graefe, Holthouse, Critchett, Walton, Lucas, Mackenzie, Duffin, Cooper, Elliot, Hall, Struthers, Middlemore, Partridge, Little, Adams, Broadhurst, Dixon and Brooks are associated with the first operative attempts to cure squint. Though these men indulged in much argument as to whether squint was due to shortening, thickening, simple

*Naumoff. *Archiv. f. Ophth.*, Vol. XXXVI, No. 3.

†Steffan. *Archiv. of Ophth.*, Vol. XXVIII.

‡Connor. *Jour. Amer. Med. Assn.*, Jan. 22, 1898.

||Kunn. *Rec. d'Ophth.*, May, 1897.

functional impairment, or all of these conditions of the muscles, most of them believed that the cure of the deviation was the cure of the disease.

In the period which has intervened between the earlier men and those of to-day in this field, the battle ground of argument has gradually spread beyond these narrower confines. The questions as to whether amblyopia is due to congenital imperfection, to strabismus, to disuse, or to suppression of vision—or to any or all of these factors; whether strabismus is due to structural change in the extra-ocular muscles, to amblyopia, to innervational abnormality, or to some functional departure from normal, either congenital or developmental; whether operative or non-operative procedures should be adopted as corrective measures; whether age should be a consideration in deciding when to begin treatment of such visual defects; and of what value are glasses in the treatment of these conditions—all have been argued pro and con with but little avail as far as bringing about any nearer approach to unanimity.

From the point of view of normal binocular single vision, the question of etiology may be studied with much less confusion of ideas. The deductions from the great amount of pathologic and physiologic study of these conditions by so many observers should be applied to solving the question of etiology *from the standpoint of this normal*; and the answer must be of value in considering possible prophylactic measures tending to prevent departures from this normal, or possible corrective measures tending to restore this normal—wholly or approximately—by removing the *cause of departure* from the state of binocular single vision.

PART II. THE ACQUIREMENT OF THE VISUAL ACT.

The birthright of vision is proper ability to perceive light.

There is a certain analogy between the anatomic distribution of the visual percipient elements in the retina and of the tactile percipient elements on the body surfaces. But, in both, upon *development and education* of the portions acquiring nice distinctive abilities depend

these differences noted in the stage of adult development, even though the anatomic distribution of the tactile corpuscles and the cones predispose to such acquisition. *Proper light perception is the one necessary prerequisite for the development of the full visual abilities.* All other attributes of vision depend on highly specialized appreciation of nice distinctions between differing light stimuli. This appreciation is attained along with other physical and physiologic developments—memory, intellection, co-ordinations and associations between all the special senses, and the motor functions.*

Von Graefe believed that binocular single vision was a congenital attribute. Baumgarten believed that the macula was developed after birth, while Steffan believed that, with the incomplete medullation of the optic nerve fibers present at birth, isolated conductivity on the part of these fibers was impossible. Others have held other beliefs as to the extent of the *gift* of vision. *The only attribute of vision of the nature of a gift is proper ability to perceive light.*

Cheselden† was the first to publish data concerning the testimony of persons blind from infancy and operated on in adult life. The reports of many similar cases have been published since that time; the consensus of all tending to bear out the statement that perception of light is the only congenital attribute of vision. Trombetta‡ says that his patient, ten years old, had neither binocular nor simultaneous vision. It was necessary to develop the faculty of attention, to establish association between the tactile and visual senses, to obtain a gradual substitution of visual for tactile senses, and to train the associated movements of the eyeball. His conclusions are that the education of persons seeing for the first time involves developing the faculty of attention (causing the visual axis of one or the other eye to fall upon the point engaging the attention) and the retinal reflex of convergence (causing the *two* visual axes to intersect at this point). One must obtain first

*All the other senses develop similar abilities of distinction between differing stimuli. The banker's fingers tell him of a bogus coin which would fail to excite suspicion in the hands of another.

†Cheselden, *Philosoph. Trans.*, 1728, p. 447.

‡Trombetta, *Ann. di Ottalm.*, 1901, p. 17.

binocular, then simultaneous vision; and at the same time, association between tactile and visual impressions, with a gradual substitution of the visual for the tactile images in the brain.

That *interruption of the learning* of the visual act is followed by results similar to those seen in cases which have *never seen* is proved by the reports of many observers. Before the act of seeing has been firmly established and completely learned, retrogression, "forgetting how to see," follows hard upon the interruption of learning. Graefe, Schirmer, Leber, Samelsohn, Axenfeld and others have studied such cases as those in which interruption occurs by the onset of blepharospasm, traumatic cataract or similar interference with vision. Graefe believed the bad vision he noticed in previously normal eyes after an apparent blindness for months due to blepharospasm, to be due to pressure as in glaucoma. Schirmer, in publishing similar cases, agreed with the views of Graefe. Leber noticed absence of all symptoms suggesting glaucoma in his cases, and was the first to perceive that the true explanation of the defective vision was to be found in the fact that the children had forgotten how to see and were re-learning the visual act. Samelsohn accepted the explanation of Leber. Axenfeld notes the disturbances in orientation and absence of visual memory seen in a boy six years old who was blind of acquired cataract for one year and subsequent to operation once more began to see. He had forgotten how to use his eyes and was compelled to relearn entirely the visual act. Axenfeld believes that under such circumstances a child blind for even so short a time can be compared with one born blind, the only difference being that in the former case the patient learns how to see more readily than is usually the case in the congenitally blind. Such cases differ from those who learn the visual act normally only in the *time of starting to learn*. In the normal the other faculties, senses, reason and memory are being developed coincidentally with the learning of the visual act. In the other cases, many of these faculties and senses have already been developed to a greater or less extent. Consequently the learning how to see is accomplished with greater facility because of the co-operation of these adjuvants.

The optic nerve fibers ramify in the corpus geniculatum externum, where they end. Here a new system of fibers takes its origin in the ganglion cells and terminates in the visual sphere.* In their course through the retina, chorioid and sclera, the axis cylinders of the distal neurons of this system are non-medullated. They receive their medullary sheath after leaving the eyeball.† In the visual cortex there are three distinct divisions, according to function: the sensory visual centers, which have to do with receiving afferent impulses carried by the system of sensory neurons from the percipient layer of the retina; the psychic visual centers, which have to do with translating such impulses into visual consciousness; and the motor visual centers, which have to do with discharging efferent impulses to the intra- and extra-ocular muscles in response to the sensory impulses and to those received from the psychic centers. An intricate network of association fibers connects these visual centers so intimately that activity in one arouses immediate responding activity in the others.

Sharkey‡ notes that, although each angular gyrus seems able to subserve the vision in both eyes, it cannot make up for visual defect produced by disease of the occipital lobe. He believes there is in the occipital lobe a lower center through which impulses must pass on their way to the higher centers in the region of the angular gyrus, and that disease of the lower center or of the fibers in connection with it intercepts visual impulses on their way to the higher centers; but, each higher center being connected with the *whole of both lower centers*, destruction of one higher center does not interfere permanently with the vision in either eye.

The motor nerve systems, by which impulses are carried from the cortex to the intra- and extra-ocular muscles, comprise neurons arising from motor centers of different rank. From the centers of highest rank, the cortical centers for voluntary movements of the eyes: from the association centers, for coördinating the actions of the individual ocular muscles; and from the centers of lowest

*Forel. Archiv. f. Psychiat., Vol. XVIII.

†Huber. personal communication.

‡Sharkey. Lancet. May 22, 1897.

rank, on the floor of the fourth ventricle, fibers are collected into nerve trunks and distributed to the intra- and extra-ocular muscles, via the oculomotor, trochlearis, and abducens nerves. These fibers are medullated.

In the eighth month of fetal life the entire visual tract consists of only bare axis-cylinders without medullary sheaths.* According to Fleischsig, the formation of medullary sheaths has begun in the optic nerve at birth and extends in a centripetal direction, not being completed in the transcortical area of association fibers until the end of the tenth month.

The eyes of the majority of new born children are hypermetropic, the retina being situated in a plane anterior to that of the emmetropic eye. In the course of anatomic development the retina may remain in this plane, may become situate still farther anterior, or may approach that of emmetropia. In the first two events the eyes remain hypermetropic; in the third event, should the retinal plane approach, but fail to reach, that of emmetropia, the eyes remain hypermetropic; should it reach this plane and remain in it, the eyes become emmetropic; should it pass beyond and come to lie posterior to this plane, the eyes become myopic.

The eyes of the new born do not fix their gaze steadily upon any object, owing to absence of volitional stimulus from the psychic cortex. This ability to direct the gaze steadily in scrutiny is to be acquired only in company with general intellectual and cerebral development. That this is not a congenital attribute of vision has been remarked by various observers. C. Kunn§ proves that the associated eye movements are the result of experience and training, not an inherent faculty. Trombetta‡ speaks of the

*Von Graefe and Steffan based a belief in the impossibility of an isolated conductibility on the part of the entire visual tract at this time on the fact that the axis-cylinders are bare. This is unwarranted. Nearly all the sympathetic nerves to the eye are non-medullated, yet they possess isolated conductibility; and the very fibers of which von Graefe speaks—those of the optic nerve—are non-medullated normally throughout life during their entire course through the retina, choroid and sclera, receiving their medullary sheaths after leaving the eyeball.

†C. Kunn, *Rec. d'Ophth.*, May, '97.

‡Trombetta, *Ann. di Ottalm.*, '91.

steps necessary to develop "the faculty of attention;" Axenfeld* notes the necessity for similar development; others have referred to this development as "the power of central fixation," "the guiding faculty," "fixation." W. Preyer† made observations on his own child during the first three years of life: "Reflex closure of the eyes and contraction of the pupil on account of strong light are congenital, but reflex closure of the eyes on the approach of objects near them appears during the third month. * * * Close and repeated observation of the movements of the eyes taught me that particularly during the first six days the turning of the eyes to the right or to the left is not co-ordinated as symmetrically as in adults. Repeatedly I saw in a child whose eyes were wide open movements which a careful examination showed to be not exactly alike. I found that often the one eye moves independently of the other and that the head is turned in the opposite direction to the movement of the eyes. So that it is quite evident that both movements are without aim and that the coincidence of the two in the early days of life is accidental. * * * The movements of the eyes finally become well co-ordinated after the lapse of four years."

There is a wide difference in character between certain movements of the eyes and others apparently similar, under totally different circumstances. Movements of a *purely reflex* character are seen. Such movements may take place *independently of intracranial connections*‡ or control. Other reflex movements, such as the rolling up of the eyeball on winking of the approach of an object close to the eye, are *dependent upon intracranial connections* and control. Movements of a *purely voluntary* char-

*Axenfeld. Klin. Monat. f. Augenhk., '00.

†W. Preyer. Die Seele des Kindes.

‡Witness the result of an explosion of a test tube held in the hand of a chemist; the bits of glass being found imbedded in the eyelids, but none of them having reached the eyeball. The retinal percipient layer appreciated the explosion, and a motor response closing the eyelids occurred before the brain had time to grasp the situation. This was rendered possible by the "short circuiting" fibers connecting the sensory and motor systems of the optic apparatus.

acter are seen, in which control over both intra-* and extra-ocular* muscles is shown. Movements of *complex* character are also seen, as for instance the turning of both eyes in a certain direction in order to observe an object. Volitional and association impulses to the intra- and extra-ocular muscles are involved in such movements.

Not only are the *movements* of the eyes to a certain extent to be governed by psychic control; *visual activity* of one or both eyes may also be influenced by similar control. Many persons *involuntarily* suspend visual appreciation of objects falling within their range of vision when the mind is preoccupied. In deference to deep thinking or effort of memory the other faculties remain in abeyance.†

A *voluntary* suspension of visual activity of one eye is seen in ophthalmologists, microscopists, and telescopists, during the time when one eye is scrutinizing the field of the instrument, the other remaining open.

Analysis of vision in its fully developed state involves consideration of four factors:

1. Normal visual fields—in perception of light.
2. Normal visual acuity—in perception of form, or of the first and second dimensions.
3. Normal perception of color.
4. Normal sense of perspective—in perception of space, or of the third dimension.

Inasmuch as the visual impression of an object as viewed by a normally related pair of emmetropic eyes differs from the visual impression of the same object as viewed by each eye individually, the above—named fact-

*Some ophthalmologists are able to relax accommodation voluntarily, an ability attained by the long use of the ophthalmoscope. Others even after years of practice, are unable to relax the ciliary muscle in this manner.

*Many persons can converge at will, absolutely independently of visual accommodation. Others have no voluntary control over the converging muscles.

†That this suspension (or suppression) of visual activity is not due to actual dimming of the retinal image, but is dependent upon suspension of psychic appreciation of this image, is proved by the fact that the phenomenon is observed in old people wearing full correcting lenses. In such cases relaxation of accommodation cannot be held responsible for the suspension of vision.

ors must be considered first, in relation to monocular single vision, second, in relation to binocular single vision.

The Visual Field. *In monocular single vision* the normal field extends to varying limits in the four cardinal directions. To the temporal side it has an extent of nearly 100 degrees, so that objects in this position are visible even though they lie in a plane somewhat behind that of the pupil. The reason for this lies in the fact that the rays of light sent to the eye from a point so situated undergo such deviation by corneal refraction that they enter the pupil and reach the retina. Above, it has an extent of 65 degrees; to the nasal side, 65 degrees; and below, 75 degrees. *In binocular single vision* the normal field is larger than in the monocular type. Whereas the lateral range in the monocular field is about 165 degrees, this range in the binocular type is nearly 200 degrees. In vertical range the monocular and binocular fields are of equal extent, 140 degrees.

Consideration of three forms of sensation is necessary in studying the visual fields: Form sense, Color sense and Light sense.

Form sense is the faculty by which we recognize differences in the shape of objects.

Color sense is the faculty by which we recognize differences in color.

Light sense is the faculty by which we recognize differences in degree of brightness.

These three forms of sensation are functional attributes of the retina throughout its entire extent. But different portions of the retina possess these senses in differing degrees. The distribution of the retinal percipient elements, the rods and cones, is such as to allow most acute perception of form at the center of the binocular visual fields, the center of fixation. This point in the retina is the fovea centralis, and the region immediately surrounding it is the macula lutea or macular region. At the fovea the cones are situated at a distance of 0.002 mm apart. The diameter of a single cone is 0.00218 mm. The smallest difference between two points on the retina which can be separately perceived is 0.00436 mm., about twice the diameter of a single cone.* "Hence it is probable that

*Hartridge. The Refraction of the Eye.

rays from two points must fall upon two different cones in order to be visible as two distinct objects." (Hartridge.) The true measure of acuteness of vision is the visual angle which is "the angle subtended by the rays which pass from the terminal points of the object through the nodal point of the eye to the retina." (Fuchs.) The smallest retinal image which can be perceived at the fovea is that whose visual angle is $1'$. Two points separated by an angular interval of less than $1'$ produce upon the eye the effect of one point only.

Progressive recession from the fovea reveals increasing distances between the cones, and coincident progressive diminution in the acuteness of form perception. As the peripheral limits of the visual field are reached the cones disappear leaving the rods to discharge the functions of perception. The cones have to do more particularly with perception of form, the rods with perceptions of movement and luminosity. Exner states that for perception of movement as well as of slight differences in luminosity the periphery of the retina is more keenly sensitive than the center. In answer to the question "Of what use then, is peripheral vision if we can get no well defined perceptions with it?" Fuchs remarks that we can best appreciate the value of vision at the periphery by observing persons who have lost it to such an extent that only the fovea and its immediate vicinity retain their normal functional ability. "as happens in many diseases, especially in retinitis pigmentosa. Such persons may still be able to read the finest print and yet are in no condition to go about alone * * * The images falling upon the periphery of the retina give us warning signals which make us cast our eyes directly upon the objects which excite the images. And it is precisely moving objects that are most sure to attract our attention, since the peripheral portions of the retina have a high degree of sensibility for the perception of movement."

The perception of color is also most acute at the fovea. and progressive recession from this point reveals steadily increasing impairment of this acuteness.

The perception of light is almost equally distributed throughout the whole field of vision except that, as has been mentioned, perception of nice distinctions between

luminosities of slightly differing intensities is a little more acute at the periphery than elsewhere.

Visual Acuity. This term is commonly used to refer to the perception of form only. A person may be absolutely red blind or green blind, or his visual fields may be very much contracted, yet if he is able to read correctly type VI at 6 meters distance his visual acuity is said to be normal, 6/VI. As has been mentioned, the point of most acute perception of form is the fovea. In order to effect the clearest possible appreciation of the detail of an object scrutinized the eye is brought into such a position that the fovea may be stimulated by the rays coming from that object. Perception of form is just as acute in monocular as in binocular single vision; in other words, two normally related emmetropic eyes, acting together in perfect harmony, are able to distinguish between two points the rays from which stimulate two adjacent cones at the fovea, and either one of that pair of eyes acting alone is just as fully able to appreciate the same distinction.

Perception of Color. The same equality exists between monocular and binocular single vision in regard to color perception at the center of the visual fields, i. e., in regard to *acuteness* of color perception. Owing to the larger limits of the color fields in the binocular type the *range* of color perception is wider in binocular than in monocular single vision.

Perception of Space. In monocular single vision sense of the third dimension is dependent almost entirely upon comparison of the sharpness of detail of an object scrutinized with the sharpness of detail of certain other objects within the scope of vision bearing certain positional relations to the object scrutinized. With visual education there develops a certain "accommodation sense," analogous to "muscle sense."* Through this "accommodation sense" alone the estimation of distances, within certain limitations, is possible. But for distances of 6 meters

*By virtue of "muscle sense" the individual is conscious of the position of certain muscles even though they be absolutely at rest; for instance, when the hand is hanging suspended in the air the slightly flexed positions of the fingers will be appreciated by the brain, even though the fingers are not in contact with each other.

or over scrutiny does not excite accommodative effort in emmetropic eyes and estimation of the third dimension under such circumstances is possible only by comparing the detail of the object scrutinized with the detail of certain other objects within the scope of vision bearing certain positional relations to the object scrutinized.

Parallel action also plays a part in the estimation of distance, both in binocular and in monocular single vision. It is obviously of much greater value in the latter type because of the restrictions placed upon such estimation by the lack of a second viewpoint which the second eye furnishes in binocular estimation.

On the other hand the presence of the normal sense of perspective might be said to be "*orthognomonic*," of binocular single vision. The explanation lies in the fact that in scrutiny the object is looked at from one point of view by one eye, from another point of view by the other eye. The result is that the second eye furnishes a third fixed point for its fellow, the other two fixed points upon which the estimate is constructed being situated in the first eye and the object scrutinized respectively. Just as three fixed points are necessary to the construction of a figure involving cubic dimensions so three fixed points are necessary to the visual estimation of cubic dimensions. Sense of perspective is so imperfect in monocular single vision that it is small exaggeration to say that this sense is an attribute of vision *limited to that of the binocular single type*.*

The Law of Corresponding Retinal Points.

Two eyes so coördinated and functionally competent as to possess binocular single vision act in obedience to the *law of corresponding retinal points*. "The macula of each retina must correspond point for point with its fellow; the vertical meridian of each eye must everywhere correspond with that of its fellow; the same relationship must exist between the horizontal meridians of the two eyes; any retinal point in one eye bearing a certain relationship to the macula, the vertical and the horizontal meridians of that eye, must correspond with a point similarly related to

*The visual axes in binocular single vision may be conceived as holding in their grasp an object whose distance from the eyes is being estimated visually.

the macula, vertical and horizontal meridians of the other eye." (Savage.)

Were it true of all eyes of similar refraction that the macula, the vertical and the horizontal meridians are always in exactly similar situations with reference to a certain fixed point in the fundus, as, for instance, the optic nerve head, then it were true that corresponding points are similarly situated in all such eyes. But, as these all may vary in different eyes of the same refraction, it follows that the situations of corresponding points in one pair of eyes are not necessarily similar to those of identically corresponding points in another pair of eyes of the same refraction.

When one eye only is receiving visual impressions psychic translation of the visual sensory impulses results in the appreciation of one single image, formed on the macular portion of the retina. In order that a correct image of an object observed may be formed on the retina, the line connecting the centers of objects and image must pass through at right angles to the plane of the refracting media. Varying degrees of departure from this perpendicular result in varying degrees of distortion of the retinal image because of the resulting unequal refraction in different meridians. In order that the retinal image may be free from distortion and may fall upon the macula, that portion of the retina whose visual perceptibility is most acute, the normal eye in scrutiny assumes the position which allows the line connecting the centers of image and object to pass through perpendicular to the plane of the refracting media and find its point of retinal junction at the fovea. This is the *position of fixation of the eye* and the line connecting the centers of image and object in this position is the *visual axis*. All other objects within the scope of vision also send rays of light into the eye along lines which connect the sources of the rays with points on the retina. These lines which connect retinal points other than the fovea with observed points other than the point of fixation are *visual lines*, so called in contradistinction to the visual axis.

When both eyes are receiving visual impressions the conditions under which the brain becomes conscious of the details of objects observed are quite different from those

when one eye only is acting. In normal binocular single vision each eye assumes the position of fixation, their visual axes meeting at the point scrutinized. By virtue of cerebral control over the extra-ocular muscles the position of binocular fixation is assumed and maintained. This intersection of the visual axes during scrutiny is constant, whether the point scrutinized be far or near. And as the gaze of the eyes is shifted from one point to another the visual axes continue in intersection. Such perfect consonance of associated movements demands adjustment of extreme nicety. An analysis of the requisites for such adjustment reveals two principal motor elements, accommodation and convergence; the former depending upon action of the ciliary muscle, the latter, upon the extra-ocular muscle.

Light rays, whether they are so refracted as to form a clearly defined retinal image or not, stimulate the retinal percipient elements. As a result of such stimulation discharge of sensory impulses occurs. These impulses are carried along nerve fibers which, "passing from the two maculas, find their way to the same optic tract and thence go to the same cuneus."* The sensory impulses properly conducted to and translated in the brain, awaken psychic consciousness of the retinal image. This consciousness is not measured by the clearness of detail of the retinal image. If the image is sharply defined the brain will be acutely conscious of a clear detail of the object; if the image is ill-defined the brain will be *just as acutely* conscious (but) of an indistinct detail of the object. The response in the ciliary muscle, accommodation, corrects discrepancy in the clearness of the retinal image except that due to such conditions as are beyond the powers of accommodative adjustment to rectify.†

Accommodation has to do with focusing the eyes properly for the distance of the point scrutinized. The refraction of the emmetropic eye is such that parallel rays of light are brought to a focus on the retina. Rays coming

*"If the maculas fail to have a common connection with the brain other retinal points which ought to correspond cannot do so and there must be diplopia in all parts of the field." (Savage.)

†As for instance, distortions due to astigmatism or opacities in the refractive media.

from an object 6 meters or more distant from the eye are so nearly parallel that the difference is inappreciable. Therefore retinal images of objects 6 meters or more distant from the emmetropic eye will be sharp and clear without accommodative effort. But as the object is moved nearer than 6 meters the successively greater divergence of rays entering the eye becomes appreciable; and the focus of divergent rays falls upon a plane posterior to that of the retina of the emmetropic eye. By virtue of the power of contraction of the ciliary muscle and the inherent elasticity of the crystalline lens, the index of refraction of the eye can be so changed as to bring this focus forward to a position in the retinal plane. This ability to regulate the refractive index of the eye is accommodation. By virtue of accommodation the eye is able to bring about appreciation of detail in both near and distant scrutiny.

In monocular observation, upon accommodation alone depends this appreciation of detail in both near and distant scrutiny. But in binocular observation in addition to accommodation constant intersection of the visual axes must be maintained at the point scrutinized. For distances of 6 meters or more the visual axes are so nearly parallel that the lack of parallelism is not appreciated. But as the object is moved nearer than 6 meters eyes assume such convergent positions as will allow maintaining intersection of the visual axes at the point scrutinized. By virtue of consonant action of the extra-ocular muscles the maintaining of such conjugate positions is accomplished. This ability to maintain intersection of the visual axes at the point scrutinized is convergence. Accommodation and convergence are very closely associated and it is evident that, in order to accomplish binocular single vision by the co-operation of the visual apparatus and the cortex, harmony must be constant between these two.

The *monocular act of single vision* involves the following steps: In a process of psychic cerebration volition purposes scrutiny. In accord with this process motor impulses are sent to the intra- and extra-ocular muscles. The visual axis of the eye is directed to the object to be scrutinized, by activity on the part of the extra-ocular muscles in obedience to these motor impulses. The rays

from this object are thus brought to fall upon the retina and stimulate the retinal percipient elements. Sensory impulses thereupon proceed to the sensory visual centers and responding activity of the psychic centers results in consciousness of the detail of the object observed. Motor impulses in obedience to the responding activity of the motor centers are sent to the ciliary muscle, and the accommodation mechanism is caused to bring the focus of the rays to the plane of the retina. The result is the formation of a clearly defined retinal image of the object. In obedience to the sensory activity of the rods and responding motor activity of the centers the muscular fibers of the iris are caused to shut out from the retina any excess in the quantity of light admitted to the eye.

The act of *binocular single vision* involves a series of similar steps, and in addition, blending of the visual impressions from the two retinas. The visual axes intersect at the object under scrutiny and resulting retinal stimulation by the rays from the object awakens consciousness in the psychic cortex. By virtue of the ability of the brain to blend into the consciousness of one whole image the impressions received from two images, one on each retina, single vision is maintained. Accommodation and pupillary action follow. And as has been mentioned the blending of the slightly dissimilar images results in sense of the third dimension.

*The degree of dissimilarity differs inversely as the distance of the object observed. Upon the fusing of this dissimilarity in the brain depends the estimation of the third dimension; and the same inverse ratio exists between correct estimation of this dimension and the distance of the object observed.**

Before such nice distinctions in vision can be appreciated the intelligence, reason, memory, and the other special senses of the child must be sufficiently advanced to be commensurate, in education and development. The exercise of the power of fusion is but the natural expression of

*In presbyopic recession of the near point, even though the visual acuity remain as sharp as it ever was at the near point, the correct estimation of the third dimension is impaired, as evidenced by the increased difficulty in threading a needle. Which difficulty is removed when the near point is again brought to its proper distance from the eye by glasses.

the fact that the child has accomplished what natural impulse or desire prompts. In the pre-fusion state, whatever the degree of visual acuity may be in the two eyes, no distinct appreciation of detail can be had while there exists in the brain consciousness of the two separate, dissimilar images. With the age which brings intelligent observation on the part of the child there develops an impulse for fusion of the two images into one distinct whole. Just as there is a natural desire for the performance of any other function normal to the organism, so there is a natural desire for fusion. Upon the stimulus of this natural desire depends the learning to accomplish binocular single vision.*

The refractive index of the eyes may or may not be hypermetropic at birth. Emmetropia is approximated in the majority of cases in the first year or two of life. The intracranial nervous connections must be anatomically completed, but this completion does not depend upon, though

*Steffan says: "If the impulse for fusion in children exists physiologically, far more will be accomplished instinctively to regulate the positions of the two eyes (in binocular observation) than in adults under similar circumstances." Worth attempts to awaken "the desire for fusion" by orthoptic exercises with his amblyoscope. In another article the writer says: "If we can succeed in bringing about the awakening of this desire for fusion we will have won to our aid a most powerful factor in establishing binocular single vision." H. Schmidt-Rimpler says: "A perfectly correct position only results when binocular vision is obtained. Here another factor comes into play—the desire for binocular fixation." Worth attributes binocular single vision to the exercise of what he chooses to consider an independent faculty of the mind, "the fusion faculty." In speaking of alternating convergent strabismus, he says: "The visual acuity is usually good in each eye, the refraction of the eyes is very nearly the same and in many cases there is little or no refractive error. If such a pair of eyes becomes dissociated it means that the fusion faculty is in a very rudimentary condition." Fick speaks of this natural desire for fusion also (*Correspondenzbl. f. Schweizer Aerzte*, 1889). A. Toplanski (*Graefe's Archiv. f. Ophth.*, Vol. XLVI) goes so far as to believe that there is developed in the brain a special center governing fusion. H. Parinaud (*Traité de Therapeut. A. Robin*, Paris, 1897) speaks of the development in the brain, after birth, of "an apparatus for binocular vision in the center for coördination," which apparatus governs fusion. The result of Kunn's studies led him to believe that the association of the two eyes in fusion depends upon experience and training, and is not in any way an inherent ability of the optic apparatus.

it is probably furthered by, the acquisition of visual knowledge. It is, however, absolutely essential that the *use of these association tracts be learned* by the child, and the degree of higher specialization of the visual functions is measured by the proficiency attained in this use. Before the end of the first year the first indications of binocular visual ability are shown by the majority of normal children. In a long series of investigations made upon the eyes of healthy infants in large crèches of London, Worth "found the first distinct evidences of binocular vision at the age of six or seven months." Binocular visual ability is very imperfect at first, but with the rapid advance of intelligence and development along other lines, there occurs a correspondingly rapid improvement, and by the end of the fourth or fifth year binocular single vision is accomplished by normal children. There can be small doubt that from the stage of mere quantitative perception of light to the stage of full development and binocular single vision, the main factor in the higher specialization of the sense of sight and in the advance of visual abilities, is *learning*.

Concerning "learning how to see," Steffan says: "The true appreciation of space as well as of the form and color of an object seen is obtained through the association in the cortex between the visual impression of that object and the impression made by the same object upon the other centers of organs of sense, and the motor centers; in other words, the child attains the conscious use of his eyes in accordance with reason at the same time he attains the like use of other organs of special sense. While one child will be more forward than another, just as in learning to speak, about four years will elapse before the intricate nervous tracts are anatomically completed and their use thoroughly learned."

PART III. PATHOGENESIS AND DIFFERENTIAL DIAGNOSIS.

Inasmuch as binocular single vision is a result of normal development, anatomic, physiologic and intellectual, attained coincidently with similar development of the other special senses and reasoning abilities, and their correlated motor functions, it follows that any influence of a nature to pervert or interfere with such development must be

made manifest by departure from this normal in sensory, motor or reasoning functions, or all.*

The results of learning how to see along other than normal lines are shown in the various defects embraced in the two general headings, Strabismus and Amblyopia. That the true nature of these disorders has been ignored to such an extent as to result in their being named by one or the other of their most prominent symptoms, is unfortunate.†

Of eyes which manifest departure from the normal there are some which show evidences of congenital imperfection, disease, developmental error, traumatic or other defect. In others no such evidences can be found by the methods of observation of which we are capable at the present day.

It may be that in these cases evidences of defect have

*Hippocrates, who wrote of strabismus at a time when there existed no knowledge on the subject of the physiology of vision, regarded it in the light of a deformity which he said was a thing of inheritance, but sometimes resulted from disease. And writers and observers succeeding this great man followed in his train of thought. Early in the 18th century there flourished a great quack, John Taylor, who published a book, "De Vera Causa Strabismi," in 1738, a copy of which the writer has been enabled to see through the kindness of Dr. Casey A. Wood of Chicago. That this charlatan regarded squint as a deformity due to lack of equilibrium of the muscles which move the eye is evidenced by the words of LeCat quoted by Stevens (*Annals of Ophth.* Vol. VIII, No. 2): "I availed myself of the freedom which he accorded me to inquire the motive for an operation which appeared to me to be absolutely useless not to say dangerous. He replied that an eye only squinted because the equilibrium between its muscles was destroyed, and that to re-establish this equilibrium it was only necessary to weaken the muscle which dominated the others, and this is what he did in cutting one of the nerve filaments which was distributed to this too powerful muscle." Savage thinks that in saying this to LeCat, Taylor purposely made a misstatement. Heurman, in saying "Taylor also proposed to cure squinting by the division of the tendon of the superior oblique muscle of the eye," would seem to indicate that Taylor was not trying to mislead LeCat but was simply ignorant as to whether the results obtained by the cutting were due to division of a nerve or a tendon.

†It has long been noticed that strabismus and allied ocular disorders of function are more frequently found associated with insanity than with normal reason, and this connection seems pertinent.

not been found because of misguided searching on the part of investigators, or it may be that with improved technique and armamentarium in the progress of ophthalmoscopic and other methods of diagnosis, lesions and abnormalities will be revealed which have so far escaped detection. Inability to demonstrate evidences of defect does not mean that these are not present, or that these are of a nature beyond our ken, such as "the capricious dislike of the cerebrum."*

The period of intrauterine existence is not always passed with impunity. Various vices of development and function are traceable directly to influences acting, or to accident to, or disease of the mother, during this period. Parturition is fraught with danger to the child and the head in its passage through the birth canal is especially exposed to injury, by direct traumatism or in consequence of compression of the bones of the cranium. Königstein, Schliech, Naumoff and Bjerrum have all noted injuries during birth which may affect vision. Naumoff reports examinations of the eyes of 47 infants born at full term, and of 22 infants born before full term, all of whom had died either during or shortly after birth. In the eyes of over 25 per cent. of those born at full term pathologic conditions were found. Königstein found pathologic

*This phrase was formulated by Connor in speaking against the suppression view of such visual defect. This writer fails to grasp the question when he says: "A presumption against the suppression view arises from the fact that in no other instance is it claimed that the brain, by inhibition, actually destroys the functional activity of any organ beyond the possibility of restoration. We have many illustrations of imperfectly formed organs as clubfoot, hare-lip, colobomas of the iris, retina, and chorioid; but we know of no organ born with normal development, rendered imperfect by the capricious dislike of the cerebrum." (*Jour. Amer. Med. Assn.* Jan. 22, 1898.) It is not claimed by those who advanced the suppression theory that, "the brain, by inhibition, actually destroys the functional activity" of the eye which, with a normal fellow fails of accomplishing its conjugate visual functions. Destruction postulates existence. In a visual apparatus which has been incapable of binocular single vision the conjugate visual act has never existed. Connor predicates an absurdity when he says, "born with normal development." Normal development is at best acquired only after four or five years of steady learning on the part of the child with the constant aid of advancing knowledge in other lines closely associated with, and adjuvant to, the visual function.

changes in the eyes of prematurely born children also. Of these pathologic changes hemorrhages constituted the great majority. Naumoff found choked disc in two full term infants which he ascribed to the great increase of intracranial pressure during labor by compression of the bones of the skull. Hemorrhages occurred in the sheath of the optic nerve in two cases, in the chorioid in three cases, in the different layers of the retina in five cases. Hemorrhages both per rhaxis and per diapedesis were present. Retinal hemorrhages he regarded as due to increased intracranial pressure; hemorrhages of the chorioid, conjunctiva, and various other parts of the eye he ascribed to vascular engorgement. He claimed the essential factors in the production of the pathologic conditions to be narrow pelves and prolonged duration of labor. He concludes that: "1. Changes in the eyes of the new born are found not only after labors which are in certain respects abnormal, but also after those in which the course has been normal. 2. Children whose mothers have narrow pelves show pathologic changes in the eyes more frequently than those whose mothers have normal pelves. 3. The occurrence of pathologic changes in the eyes of new born infants stands in relation with the duration of labor, no matter what may cause its prolongation. 4. Such changes occur more frequently in the first born than in succeeding children because of the longer duration of labor in primiparae." Schleich reports ophthalmoscopic examination of 150 new born infants in whom he found pathologic conditions in 36 per cent. as follows: "1. Abnormally pale optic nerve sheath with marked thinning of the vessels in 3.3 per cent. 2. Choked disc in 7 per cent. 3. Retinal hemorrhages in 32 per cent.; of these 29 cases showed hemorrhages in both eyes, 20 cases showed hemorrhages in one eye only."

These hemorrhages are all rapidly absorbed within a few days. Autopsies on still born infants not infrequently show intracranial hemorrhages. Certainly after considering the occurrence of such grave injuries as luxations of the globe associated or unassociated with lacerations of the lids, fractures of the orbit, and pressure exophthalmos, it is easy to conceive injuries occurring which, because of their obscure nature may be easily

overlooked. Steffan has called attention to the possibility of such injuries occurring to the optic, abducens, trochlearis or facial nerves, and to the extra-ocular muscles, during the passage of the head through the birth canal, and adds: "A normal labor certainly gives no guarantee that an injury may not have occurred to one or both optic nerves sufficient to cause an amblyopia which would be designated congenital, although occasioned by an injury during parturition. If such an injury should occur to the optic nerve above the vessels, an ophthalmoscopic examination after birth would reveal no lesions and hemorrhages into the retina would quickly disappear leaving no observable trace except it may be such an amblyopic disturbance as central scotoma."

Such an eye examined later in life, might well answer the description of Maddox "no matter how amblyopic the squinting eye may be, its fundus appears perfectly normal and the macula tantalisingly perfect."

Intracranial injuries of a nature to destroy portions of the visual areas of the brain will be followed by amblyopic visual defect. This has been ascertained by Bechterew, who worked extensively in vivisection experiments on the visual area at the surface of the cerebral hemisphere. (*Archiv. f. Psychiat*, 1890, No, 1.) Pertinent extracts from his conclusions are as follows: "1. By unilateral destruction of the cortex three kinds of visual disturbance can be produced; (a) binocular homonymous hemianopsia; (b) binocular homonymous hemianopsia with incomplete general blindness (amblyopia) of the eye of the opposite side; and (c) incomplete blindness (amblyopia) of the opposite eye. 4. * * * Destruction of the first named area produces * * * especially *obscuration of the region of most distinct vision*. 5. The *crossed amblyopia* sometimes observed must be ascribed to an affection of the second area. 12. The visual disturbance resulting from destruction of the visual area, and considered mental blindness by some authors, is nothing but an impairment of vision of an *amblyopic nature*."

Antonelli* has come to look upon the amblyopia of squint as a dissociation of the complex coördinations which together constitute the act of binocular single vision. This

*Antonelli. *Centralblat. f. Augenhk.*, Feb., 1898.

view is in accord with those of Toplanski,* working on rabbits, and Sherrington† working on anthropoid apes. The work of the latter is of much more scientific importance because of the fact that the brain of the anthropoid ape conforms very closely in physical characteristics to the human brain. Sharkey,‡ in studying the clinical and pathologic data of 3 cases showing such defects, shows that injury of the convolutions surrounding the posterior extremity of the fissure of Sylvius is capable of producing amblyopia of the opposite eye. The influence of asymmetric development of the bones which form the base of the skull, especially the sphenoid, on vision is shown by two cases reported by Steffan,§ in both of which the eye of the undeveloped side was amblyopic. Steffan attributed the defect to interference with the development of the optic nerve in the optic foramen or canal.

It is easy to conceive normal appearance of the fundus compatible with such visual impairment. Fortunately such impairment of function is generally limited to one side only, not affecting both eyes.

Opacity of the cornea is a condition frequently underlying disturbances of the visual functions. This may be so slight as to escape observation for a long time, and yet effectually prevent the formation of a sharply defined image on the retina. It may be the result of disease, traumatism or disturbed metabolism. Pupillary membrane, persistent hyaloid artery, or other vitreous opacity, lenticular opacities, either capsular or cortical, may with equal frequency escape observation and affect the formation of the retinal image. Colobomata of the retina, chorioid and nerve likewise impair visual abilities more or less completely according to their extent. Nerve degenerations and atrophies, lesions between the retina and cortical centers—such as new growths, inflammatory exudates—and lesions in the brain of similar character, all are capable of interfering with the visual abilities of the eye, and so affect the development of the conjugate binocular act.

*Toplanski. *Gräfe's Archiv*. Vol. XLVI., Sept. 13, 1898.

†Sherrington. *Jour. Physiol.*, Vol. XVII., Part I.

‡Sharkey. *Lancet*, May 22, 1897.

§Steffan. *Archiv. of Ophth.*, 1899, No. 5, p. 561.

The child in whom any such abnormality exists, as development goes on, learns the visual act *to the best of his abilities*. In such cases as lack absolutely all central vision in one eye the visual act learned is the *pure monocular*. Other cases, representing good visual abilities of one eye and varying degrees of impairment of those of the other eye, develop varying degrees of visual abilities approaching the *binocular*, depending upon the extent of visual disability of the defective eye. Still other cases, representing impaired visual abilities of both eyes, develop varying degrees of binocular amblyopia.

Should such a symptom as strabismus present during the period in which the child is wrongly learning the act of vision, the process of learning is not interrupted. The child continues to learn, even though the defection from normal channels is still wider because of the new complication. Steffan says: "If a child four years old begins to squint because binocular single vision has been learned either imperfectly or not at all, there can be no normal relation of corresponding points in the two retinas, for the latter certainly results from a normally learned binocular act of vision. But the learning to see is not completed when the strabismus begins, the child continues to learn in spite of it, and because only thus can it learn to localize correctly the objects seen, there comes about a certain localization of images on the retina of the deviating eye, to the extent to which it can be brought into use, which does not agree with the relation of corresponding points of normal fixation and normal binocular single vision. As the result of the strabismus, a quite abnormal relation of corresponding points is developed, *incongruence of the retina*,* an event just as comprehensible as the development of the so-called normal relation of corresponding points in the non-strabismic eye, because the relation of corresponding points in our retinas is not a congenital attribute of the eyes but is learned and developed during life."

*Boucheron (Soc. franc. d'Ophth. 1888) calls attention to the inconstancy of deviation in squint; (and to the fact that the deviation is composed of a fixed and a variable portion; the latter is neutralized by a mydriatic.) M. Sachs (Archiv. f. Ophth, May, 1897) rejects the idea of a vicarious macula in strabismus, contending that the squinter is a person who sees single with each eye, and that

The questions now arise: Can we differentiate between cases possessing only monocular single vision, and know with any degree of accuracy in which of these cases accident to the good eye will be followed by improvement in the vision of the unused eye, in which of these no such improvement will ensue; and know in which of these cases success may reward efforts to improve the vision of the poorer eye and in which such efforts are sure to be unavailing; and know in just which of these cases prophylactic measures adopted at the right time may be successful in establishing or conserving binocular single vision, and in which attempted prophylaxis is useless?

Those cases presenting such pathologic or other conditions as can be demonstrated, may be disposed of in one of two classes; in the first of which amelioration of the condition is a possibility; in the second of which amelioration is an impossibility. Certain atrophic conditions of the optic nerve, colobomata, and many vitreous and

there can be no binocular single vision because the visual fields do not overlap each other E. Browne (*Oph. Rev.* Vol. X, p. 222) notes the exercise of an independent and supplementary action in the non-deviating eye when the limit for internal movement of the deviating eye has been reached. A. Graefe takes a ground similar to that of Steffan with regard to the development of the relation of corresponding retinal points, but adheres to the strikingly inconsistent view that normal binocular single vision is a congenital attribute. The theory of incongruence of the retina is not consistent with sound reasoning. In monocular amblyopia of a degree sufficient to render binocular single vision impossible, whether there be any deviation or not, the abnormal relation of corresponding points on the two retinas is not a fixed one because the angle of deviation is not always constant nor are the excursions of the globes always of equal extent in all directions. This has been noted by Bouche-ron, Browne and others, and is borne out by the variations in the angle of deviation seen in almost every case in which strabismic records are kept daily during the course of optical or orthoptic treatment of strabismus. It is manifestly a wrong assumption to conceive a new corresponding relation of retinal points for each position in a pair of eyes which show differing angles of deviation on successive days. For these reasons also we cannot accept the explanation of Maddox in regard to the diplopia seen after certain operations; he says that this diplopia depends on one retinal point corresponding with a certain point on the other retina when the eye is in one position, and with another point when the eye is in another position. (Maddox on the Ocular Muscles, p. 159.)

corneal opacities, may be at once dropped out of consideration as beyond possible amelioration. All other of these cases, no matter what the degree of deviation or amblyopia, should be studied, and treatment adopted, with the single view to bring about the formation of a properly situated retinal image, free from distortion. *After this* has been accomplished, procedure with some other object in view may be indicated in certain cases. But without exception the *foremost consideration in* every case should be to obtain a *clearly defined, properly situated, undistorted* retinal image. Discussion of the details of such measures (optical iridectomy, for instance, in cases of macula corneae or pupillary membrane) is beyond the scope of this paper.

Other cases, in whom no such conditions of fundus or media can be demonstrated, may nevertheless be disposed of in a similar manner by means of other than ophthalmoscopic methods of diagnosis. And for the purpose of such differential diagnosis, either in the cases showing ophthalmoscopic or other evidence of defect or in those in whom the fundus and media present absolutely normal appearances, we have in the perimeter an instrument of inestimable value. In the cases first mentioned, such as those showing corneal or vitreous opacities, pupillary membranes and the like, we often find normal peripheral vision for form and color, the fields of such showing well defined central scotomata corresponding in extent with the situation of the obstruction to the light rays.* If normal peripheral vision is found in those cases whose obstructive defects are adjudged amenable to treatment, measures with a view to circumventing such obstruction should be adopted at once with every hope of obtaining improvement in the condition of the central visual abilities, and of eventually establishing binocular single vision.

And on the other hand the perimeter furnishes us with invaluable data in regard to such cases as show no depart-

*It is true that central scotoma due to other causes may occur coincidentally with such opacities of the media as would seem to be the cause of the scotoma. In which case improvement in vision would not follow even if the formation of a perfectly situated, undistorted retinal image be effected. But such coincidence must be very rare.

ure from the normal in fundus or media. If in such cases a large central scotoma be found it is at once evident that attempts to train the fusion faculty or to improve the central visual acuity, by occluding the fellow eye, by lenses, or by orthoptic exercises of any sort, are sure to be unavailing.†

Excepting those cases which present irremediable defect, as for instance, inoperable cases of corneal opacity or other direct obstruction to light rays, and those cases in which central scotoma exists in spite of a seemingly normal condition of media and fundus, the writer believes that binocular single vision may be established in every case in which such visual incoördination of the two eyes exists,† provided measures are taken early enough. The ease with which learning to see properly is accomplished will be found to be in direct proportion with the early institution of measures with this in view. After satisfying ourselves that no reason exists for not attempting to better the visual abilities of an amblyopic eye we should at once adopt measures tending to bring about such improvement.

That binocular single vision may be established in cases in which it has not existed, and re-established in cases in which it has been lost, is so strongly substantiated that it cannot be questioned. Savage says: "The chief object in view in the treatment of esotropia, whether by lenses or

†A case illustrating the errors into which neglect of perimetric examination may lead, has recently come under the observation of the writer. A seven year old child, following the instructions of the writer, had been having a weak mydriatic solution dropped in the better eye every day, with a view to forcing the poorer eye into use for near vision. A full correcting lens for the poorer eye and a smoked plano lens for the atropinized eye had been given to further facilitate the use of the poorer eye for near vision. No improvement of vision had occurred after four weeks of such treatment. Perimetric examination at this time revealed a large absolute central scotoma. Had this examination been made at first, the child would have been spared the unnecessary suspension of near vision during this period, and the writer would have been spared the humiliation of the subsequent revelation of misguided judgment on his part.

†Javal (discussion of Parinaud's paper on "Treatment of Strabismus," Soc. franc. d'Ophth. 1893) believes that every case may be cured but that the therapy often requires more time and patience than the patient will give to it.

by operations, is the establishing of binocular single vision." Bull, Duane, Landolt, Fulton, Schmidt-Rimpler, Parinaud, Javal, Worth, the writer and many others have reported cases in which efforts in this direction have been successful.*

The amblyoscope devised by Mr. Worth of London is a very excellent aid in establishing binocular single vision. For a description of this instrument and its use the reader is referred to the articles by Mr. Worth in the *Lancet* of May 11, 1901, and Vol. XXI, of the *Ophthalmological Society's Transactions*, and to that of Dr. N. M. Black of Milwaukee in the *Journal of the American Medical Association*, May 24, 1902.

Summary.

I. The only congenital attribute of vision is proper light perception. All other visual attributes depend upon *learning* on the part of the child.

II. In many cases certain influences cause this learning to be directed into other than normal paths in which event the act of binocular single vision is not learned.

III. Lack of binocular single vision is a very prevalent condition.

IV. This lack represents great loss to the individual.

V. Cases in which the casual influences can be removed may be differentiated from those in which such removal is impossible.

VI. Proper measures adopted at the right time will result in conservation of binocular single vision in a large number of cases.

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PARAFFIN—ITS USE IN THE FORMATION OF A STUMP AFTER AN ENUCLEATION.

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ILLUSTRATED.

One of the latest substitutes for a simple enucleation is the employment of paraffin for the purpose of producing a prominent stump. In this particular the paraffin occupies a place mid-way between the completely absorbable media and the non-absorbable, which are implanted into either the scleral cup or the capsule of Tenon cavity.

The paraffin is either injected or implanted into the scleral cup, thus replacing Mules's operation; or, it is injected into the capsule cavity thus replacing the Frost-Lang method; or, it replaces the glass or gold ball of the Fox method in the implantation of a sphere into the orbit after a remote enucleation; lastly it takes the place of the absorbable material (agar—agar vaseline, sponge) used by Claiborne, Belt, and Suker in either of the two cavities.

The final result obtained by the injections of paraffin into these two cavities, is far superior to the stump obtained when the completely absorbable media are similarly employed. There is practically no contraction due to the formation of cicatricial tissue as a result of the absorption of the implanted media. The paraffin is not absorbed, therefore no granulation tissue is found in the stump that can contract. However, there is a trifle of absorption and a very small amount of contraction, due to the vaseline necessarily incorporated into the paraffin to obtain the required melting point and the proper consistency. Because of this vaseline which is but partially absorbed, the paraffin becomes encysted or encapsulated and partially fenestrated by the granulation tissue.

The paraffin can be immediately injected into the scleral cup or the capsule cavity at the time of the operation, after all the hemorrhage has been checked or, it can be injected at a subsequent time. At the time of operation, you pack either cavity with gauze and carefully suture the wound over it, leaving but a small opening at one end through which the gauze is withdrawn and the paraffin is injected. In following this suggestion, you contrall all hemorrhage, which is of prime importance and, secondly you can better suture the sclera or capsule cavity when they are packed. A careful coaptation of the edges is essential in avoiding any oozing of the paraffin, as considerable force is used at the time of injection in order to fill out the cavities. Invariably considerable edema and infiltration of the orbital and the adjacent tissue will ensue. Nevertheless, this seeming complication is not any greater than in the other methods of implantation. Not infrequently the sutures give way because of the over distention of the cavities and the paraffin is expelled. The whole process must then be repeated, with greater care.

A better plan is to inject the paraffin about a week after the evisceration or enucleation. For this length of time then you pack the cavities with gauze and suture the sclera or the conjunctiva over the same, leaving only a small opening at one end of the wound through which the gauze can protrude and be withdrawn. This will permit a firm union of the wound edges, beside allowing the edema and infiltration to subside almost entirely. Then, too, it completely checks all hemorrhage at the time of injecting the paraffin, an important factor.

Perhaps the greatest field of usefulness for the paraffin injection will be in the restoration of a sunken socket after a remote enucleation. Perchance it may replace the Fox operation for the same purpose. It certainly is easier of application and the amount of fullness can be better and more definitely attained. As to the permanency, the paraffin injection is just as good as any other method.

The procedure is as follows: After thoroughly cocaine-izing the socket, as well as having freely used adrenalin (1-1000), with a pair of tissue forceps, you pick up the apex of the socket-pit; then with a narrow scalpel you

enter the subconjunctival space at the apex to the extent of three millimeters; then make an elliptical cut about the point of entrance as represented in the sketch (Fig. 1).

This will give you a pocket in both cul-de-sac, with but a single opening. The entire anterior flap of this pocket will be approximately 3 mm. thick, and the size of the pocket will be in accordance with the size of the socket to be filled out. The higher you cut in to the cul-de-sac, the more prominent will the stump be after the injection of the paraffin.

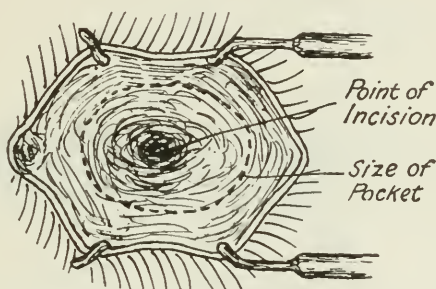


Fig. 1. Method of Making Pocket.

After checking the trivial hemorrhage, you inject about a drachm or so of properly prepared paraffin through this small opening, or enough to give you the desired fullness. However, be careful not to overdistend the cavity as this will produce not only great pain but even sloughing of the flap with the ultimate expulsion of the paraffin. Before introducing the paraffin, it is advisable to place a suture so as to be able to close the opening after the injection, it being rather difficult to do it afterward.

The reaction following the injection is usually quite severe, but, it can be controlled by the application of a cold pack for several hours and repeated as the indications arise. Generally the patient can insert the artificial shell within a week or ten days thereafter.

Sometimes the small opening through which the paraffin is injected does not close readily, though sutured. Or it may give way sometime after the suture has been removed and allow a trifle of the paraffin to escape. However it usually closes in by granulation and gives rise to no further concern.

The paraffin used for this purpose is the chemically pure white and is mixed with pure vaseline, $\frac{3}{5}$ of the latter and $\frac{2}{5}$ of the former. This gives a mixture which melts at 102 F. and does not solidify too rapidly for injecting purposes. Experiment has shown this to be the proper proportions. If the syringe is of the proper construction so as to retain heat for a length of time and the tip is not of too fine a caliber, the paraffin will cause no trouble in being injected. The cut of the one represented, which is of all metal, with an extra piece at the point, beside being wrapped in asbestos, has never been found to fail in the writer's hands. (Fig. 2.)

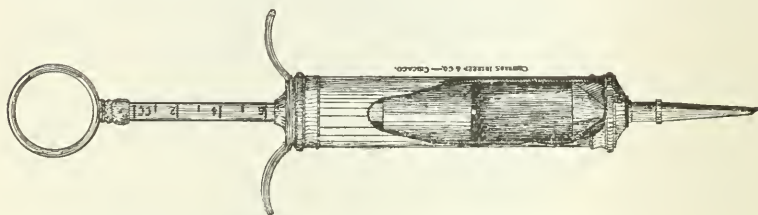


Fig. 2 Author's Syringe for Paraffin Injections.

One advantage in using paraffin in this class of cases is this: should one injection prove inefficient, a second or a third can be undertaken at a suitable subsequent time. This cannot be said of cases where completely absorbable material is employed.

Excessive heat does not liquefy the paraffin when once injected into the socket as cases among furnace men have shown this to be the fact. Neither do high fevers cause any liquefying. For the vaseline which is incorporated is practically absorbed and this materially raises the melting point of the paraffin. Pure paraffin has a higher melting point than any temperature the patient may have under ordinary circumstances. The melting point of paraffin can therefore be regulated by the amount of vaseline added: the more vaseline, the lower the melting point and vice versa.

In the hands of the writer paraffin in the class of cases just mentioned has given some very excellent results.

AN EXAMINATION, PERSONALLY CONDUCTED,
OF 4,608 RAILROAD EMPLOYEES FOR ACUITY
OF VISION, HEARING AND COLOR
PERCEPTION.

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OPHTHALMOLOGIST TO THE MOSES TAYLOR HOSPITAL.

This examination was made by me for the Delaware, Lackawanna & Western Railroad Company, whose main trunk line extends from New York City to Buffalo, and marked a new departure in the history of the company. Heretofore all examinations of this kind had been relegated to office clerks and were of necessity of a superficial character. The company created for me a new department for eye and ear examination and gave me complete charge of the same. This power I found invaluable, particularly in cases of color blindness, where the applicant, unconvinced of his chromatic defect, went from pillar to post for advice.

The men examined were included in eleven branches of the service—engineers, firemen, brakemen, drillmen, conductors, drillmasters, baggagemen, yardmasters and assistants, switch tenders, towermen, collectors and flagmen. Of the 4,608 employes, 3,709 were examined in a car fitted up for the purpose, in which I traveled from one centre of Division to another. The remaining 899 were tested in my office.

Tests. I chose as my standard of tests:

For Color Perception, the Holmgren Method, with yarns, as prepared by Bonschur & Holmes. of Philadelphia.

For Sight, Snellen's Test Cards.

For Hearing, Watch and Conversation. The noise surrounding the car made the whisper test impracticable; I therefore substituted conversation.

Form. The following form was used:

Form G. 15.

The Delaware, Lackawanna & Western Railroad Company.

LACKAWANNA RECORD OF SIGHT AND HEARING EXAMINATION.
RAILROAD

.....DivisionStationEmployee
(Old or New.)

Name....., Address.....

Present Occupation,..... Employed by.....

Applicant for Employment as.....

Social Condition..... Age,.....
(Married, Single, Widower, etc.)

ACUITY OF VISION. RANGE OF ACCOMMODATION. FIELDS.

O. D. V.....Snellen. Ac'ty' D. O. 50 Snellen....." Near Point.

O. S. V.....Snellen. Ac'ty' D. O. 50 Snellen....." Near Point.....

CHROMATIC SENSE.

Skeins:—Ability to Name Test Skeins:.....Selection, prompt, slow or hes-
itating:Result:.....

HEARING.

Right Ear: Watch:...inches. Whisper:...feet Conversation, ordinary tone:...feet.

Left Ear: Watch:...inches. Whisper:...feet Conversation, ordinary tone:...feet.

Remarks:.....

.....

.....

.....

.....

.....

.....M. D.,
Examiner.

Date,.....190.....

Classification.

After the first few days of work I found the men could be grouped in three grades.

Grade 1.

Class A included all men who came up to the requirements of new employees; that is, with color normal, sight 15/40 in one eye and not less than 15/45 in the other, with hearing normal.

Remarks on class A.

In grading the hearing of this class allowance was made for trade deafness in the case of old employes. This kind of deafness was particularly noticeable in the left ear of engineers who had seen ten years or more of service. Such passed the voice test but could hear the watch about 4 mm. from the ear—showing that the acuity of hearing for mechanical sound had been dulled by the intense noise and shrill whistles of the engines. From a hygienic standpoint it would be better if the whistles were of a lower register and more harmonious. Old employes coming up to the sight requirements of this class with glasses were also allowed to remain in the same.

Class B included all men with color sense normal but with defective vision, or hearing of a character that might be improved by either glasses or treatment, or both. Such men were retained in their positions until re-examined and then if the deafness or sight can not be improved, they will be left in class B.

Remarks on class B.

With regard to this class, it must not be understood that they were all impaired men, or that there was any stigma placed on their head; this was not an arbitrary grading. The majority of them will need but little attention to make them grade A men; such as glasses or removal of wax from the ear. The examination was made when many of them were convalescing from la Grippe, and at a time when the business of the road was unusually heavy and the men working more than their quota of time, coming to me immediately after having made long runs. Such would do better after rest and recuperation, and a second examination was due them. It will be noticed (see statistics) that a larger proportion of the older men are in this class for the reason that hypermetropia usually becomes manifest at the age of forty or forty-five.

Grade 2 included all men with weak chromatic sense, with one eye, or where sight was partially destroyed by traumatism or disease; with progressive deafness perceptible in conversation.

Remarks on grades:

There are cases where from toxic causes men have areas

of disturbed color sense which do not prevent them from selecting the main colors, but will cause them to select very slowly, to hesitate and to confuse light brown, greys, pale blue and violet. and give other unmistakable evidences of weak color perception. Such men were marked weak chromatics.

Grade 3 included all men who were color blind; also those whose deafness was so marked that they could not be retained in the service.

General remarks on grading:

The above grading was used by the company in placing employes.

For example:—Men in grade 2 were taken from positions where they might be unsafe for main line, and put into yard service, shops, etc., where they could do little damage, and not dismissed from the service. To have done this last would have demoralized the road. We had to deal with one of the oldest railroads in the country, having in its employ more than an average of old men (7 per cent. were over 50 years of age) so that in the above classification the old men were retained unless color blind, allowed to wear glasses, and where weak on color put in out of the way places. This is contrary to the standard of Allport who in *Journal American Medical Association*, October 13, 1900, suggests that old employes shall not be retained in their positions if vision sinks below 20/30 in one eye and 20/40 in the other, that employes and especially engineers and firemen must reach the visual standard without glasses and will not be allowed to wear distance glasses when on duty.

The standard for new men was made practically normal so that in their case Doctor Allport's standard can be maintained.

I am glad to report that since my examination of the system the efficient management of the Delaware, Lackawanna & Western Railroad has adopted the system whereby all employes who have been in service twenty-five years are entitled to a pension at the age of sixty.

Undertaking a work of this character, an oculist must remember that he has to deal with a lot of shrewd and practical officials who are after results. It is not a ques-

tion of cost with them, but of having the work done as expeditiously as possible, at the same time with as little friction. To avoid this friction requires tact. The employees must be made to feel that you are *sincere* and *independent*, working for their safety as well as that of the general public; that the examination will be conducted in such a manner that if there is any dissatisfaction, the complainant will have the privilege of being re-examined in the presence of a committee from his society. At first the men came to my car very slowly. They were suspicious of me and my methods. Finally a "Grievance Committee," consisting of ten Brotherhood of Locomotive Engineers, called upon me. I examined them each in turn in the presence of all, carefully outlined the object of my work and agreed as suggested above to re-examine all dissatisfied men in the presence of their friends. The majority of cases for re-examination have been for color blindness and deafness. I have already re-tested about fifty, and have found but one man (who was marked slightly color blind) whom I did not convince to the satisfaction of his friends that the condition was precisely as first found.

STATISTICS.

ENGINEERS.

Ages.	Number.	Men requiring glasses for distance.	Defective Hearing.	Weak Chromatic.	Color Blind.	Rejected. All Ages.
27-44	539	24 4.45 per ct.	17 3.1 per ct.	21 3.9 per ct.	18 3.3 per ct.	Color blind, 25.
45-49	110	13 11.8 per ct.	4 3.6	3 2.7 per ct.	2 1.8 per ct.	Eyes, 7. Ears, 5.
50-59	137	44 32 per ct.	13 9.5 per ct.	4 2.9 per ct.	3 2.2 per ct.	
60-70	13	8 61 per ct.	3 23 per ct.		2 15 per ct.	
70-75	1	1 100 per ct.				
	800	90 11.22 per ct.	37 4.60½ per ct.	28 3.5 per ct.	25 3.12½ per ct.	37 4.62½ per cent.

FIREMEN.

Ages.	Number.	Glasses.	Ears.	Weak Chrom.	Color Blind.	Rejected. All Ages.
27-44	1276	37 2.8 per ct.	19 1.48 per ct.	17 1.33 per ct.	44 3.44 per ct.	Color blind, 44.
45-49	16	3 18 per ct.				Vision, 27. Ears, 7.
50-59	6	5 83 per ct.				
60-70	2	2 100 per ct.				
	1300	47 3.61 per ct.	19 1.46 per ct.	17 1.307 per ct.	44 3.38 per ct.	78

CONDUCTORS.

Ages	Number.	Glasses.	Ears.	Weak Chrom.	Color Blind.	Rejected.
27-44	279	32 11.46 per ct.		9 3.22	9 3.22 per ct.	Disease and in-
45-49	62	13 20.96 per ct.	1 1.61 per ct.	2 3.22 per ct.		jury to eye, 5.
50-59	71	24 33.80 per ct.		1 1.404 per ct.	1 1.404 per ct.	Tobacco, ambly- opia.
60-70	11	6 54.55 per ct.			1 9.99 per ct.	Color Blind, 11.
	423	75 17.73 per ct.	1 23 per ct.	12 2.83 per ct.	11 2.60 per ct.	27 69.8 per ct.

BRAKEMEN.

Ages.	Number.	Glasses.	Ears.	Weak Chrom.	Color Blind.	Rejected.
27-44	1192	94 7.88 per ct.	4 .03 per ct.	31 2.60 per ct.	29 2.43 per ct.	12 eye- 29 color blind.
45-49	41	7 17.07 per ct.		1 2.43 per ct.		
50-59	24	4 16.66 per ct.		3 12½ per ct.		
60-70						
	1257	105 8.3 per ct.	4 .03 per	35 2.7 per ct.	29 2.43 per ct.	41 3.44 per ct.

BAGGAGEMEN, YARDMASTERS, AND ASSISTANTS. SWITCHTENDERS
TOWERMEN. COLLECTORS AND FLAGMEN. DRILLMEN
AND DRILLMASTERS.

Ages.	Number.	Glasses.	Ears.	Weak Chrom.	Color Blind.	Rejected.
27-44	717	78 10.87 per ct.	3 .418 per ct.	20 2.8 per ct.	23 3.2 per ct.	From disease and
45-49	58	16 27 per ct.		2 3.4 per ct.	6 10 per ct.	injury in eyes, 8.
50-59	47	22 46 per ct.	1 2.1 per ct.	5 10 per ct.		Color blind, 30.
60-70	6	2 33½ per ct.			1 16 per ct.	Defective ears, 1.
	828	118 14.25 per ct.	4 .483 per ct.	27 3.26 per ct.	30 3.62 per ct.	39 4.71 per ct.

Observations:

Holmgren's Method.

I have tried several apparatus for testing color blindness, but have found the Holmgren Method altogether the most reliable for general use. It does not reflect the light, and the various shades of a color are in keeping with the effect produced on railroad lights by the changes in the density of the atmosphere and background of the signal. One or two men whom I found slightly color blind by this method, I tested at night in the switching yard when several crews were drilling and verified the results.

As a striking illustration of the fact that color blindness is hereditary, I found three or four families in which two brothers, and in one family two brothers and a nephew, were color blind.

It would seem that moderate as well as excessive smoking, and chewing, causes in some individuals defective color sense. The tobacco color blindness is the most dangerous for the reason that the vision, as well as the color sense, is impaired.

Suggestions:

1. That the use of tobacco be discouraged.
2. That the men should be examined at regular stated intervals; a goodly number of them should be examined once a year because of the dangers of acquired color blindness, due to alcoholism, tobacco, injury and sickness. All men for promotion should be re-examined before the same. The prospect of such examination would be a stimulus to better living and to the maintaining of a higher standard.
3. As far as practicable, employes should have eight hours's sleep daily or an equivalent. It is a well established fact that loss of sleep causes a carelessness which may lead to intemperance, excessive smoking and general nervous irritability, unfitting a man for duty, specially the exacting duty of a railroad man.

Conclusion:

We have examined 4,608 men. 3.01 per cent. were color blind. 2.58 per cent. had weak chromatic sense. 9.44 per cent. were in need of glasses or other means to improve their vision for distance.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

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(Quarter Ending December 31, 1902.)

On a Case of Congenital Purulent Ophthalmia.

ARMAIGNAC, Bordeaux. (*Annales d'Oculistique*, October, 1902.) The number of reported cases of this affection, Armaignac says, is rare. In the larger proportion "the bag of waters" has been ruptured from twelve hours' to three days' time before the birth of the child. In such cases the explanation of the infection could be, he says, a mere mechanical one from the maternal vagina. In a case reported by Nieden, however, the amnion with the infant was expelled intact, and although the greatest care was exercised, purulent ophthalmia developed in twenty-four hours' time after birth.

In the case reported by the author the labor pains lasted only but one and a half hours, and the amnion had been ruptured but three-quarters of an hour before the birth of the child. One hour after birth the eyelids were found to be swollen and inflamed, their separation allowing the escape of a small amount of pus. The cornea were already whitened and macerated. Appropriate treatment yielded but little good result, until powdered calomel was used, when the discharge rapidly ceased. Rupture of the globes with the escape of the crystalline lenses occurred.

The author believes that the mechanical theory is very improbable in these two cases since gonococcus infections he says, could hardly develop in so short a time. Krauss,

he tells us, has discovered the gonococcus eight times in the uterine tissue in eleven cases of ophthalmia neonatorum, while the studies of other observers prove that chemical substances may pass from the maternal blood to the amniotic fluid. Unger, he reminds us, has reported a case of blenorrhagia associated with arthritis and endocarditis in which the gonococcus was found in the blood.

He concludes with a statement of his belief that the practically intact amnion is permeable to the gonococcus and that this fact may be the explanation for these cases of the congenital form of purulent ophthalmia.

Couching of Cataract; Method and Observations.

BOURGEOIS, Reims. (*Annales d'Oculistique*, October, 1902.) Bourgeois quotes the following indications for the couching of cataract as given by Delord of Montpellier. 1. When an expulsive hemorrhage is liable to occur; 2. when there is grave danger for infection; 3. in patients with little self control, such as the insane; and 4. in patients in whom coughing or other involuntary efforts may appear. As a rule the operation, he says, should not be practiced for soft cataracts in the young or in those eyes which are threatened with glaucoma. He has performed the operation of couching on two cases; in the latter case glaucomatous symptoms, followed by atrophy of the globe, followed.

At the present time, he makes, whenever possible, a preliminary iridectomy. This is done some eight to fifteen days before the operation for couching. He has found that it may be placed in the most accessible portion of the iris and that it need be only of moderate size. For the making of the corneal section he prefers the curved lanceolate knife of Panas. The couching is done with a well sharpened cataract needle, made without a stop. After cocainization, the patient is placed in a chair which is situated lower than that for the operator. The patient's head is held against the chest of an assistant. The field of operation is well illuminated by direct condensation of a dark room light. The needle is introduced through the sclera, slightly below the horizontal meridian and about five millimeters back of the corneal limbus. The point of the instrument is carried to the pupillary center and then downward and outward by raising its handle upward and

forward. It is not withdrawn until the dislocation of the lens is found to be complete.

After the operation the eye is covered by a dressing and the patient is made to assume an upright position.

He reports three cases so operated on—each with favorable results; and believes that preliminary iridectomy is an important essential for the operation.

Concerning a Case of Essential Ophthalmomalacia.

LOR, Brussels. (*Annales d'Oculistique*, October, 1902.) Lor reports the case of a thirty-six year old female, who consulted him regarding pain, lachrimation and weakness of vision of the left eye of eight days' duration. Examination revealed the presence of a slight edema of the lids with a narrowing of the palpebral opening. There was a moderate degree of injection of the globe, this being most marked to the outer side of the cornea, at which place there was the appearance of a diffuse episcleritis. The cornea was clear and the pupil and iris were intact. Oblique illumination showed a vertically oval depression in the outer half of the cornea. The condition of intraocular tension was not noted.

Instillation of a two per cent. strength solution of cocaine was so quickly followed by an improvement of the subjective symptoms that the patient was given prescriptions for boric acid and cocaine. Two weeks later, examination showed the eye to be normal.

The case, he believes, was evidently one of essential ophthalmomalacia, although a few of the most important signs—modification of the shape and the size of the pupil, edema, transparency of the cornea, and changes in cutaneous sensation, were absent.

The pathology of this affection, he believes, is undetermined, owing to a lack of definite knowledge as to the functions of the great sympathetic nerve and the relation of vasomotor constriction and dilation to hypotonus and hypertonus of the globe.

The occasional presence of hypoesthesia of the conjunctiva and cornea is an indication of an extension of the pathological process to the ciliary fibres of the trifacial nerve. In zona ophthalmica, he says, there are often important neuralgic symptoms, with grave lesions of the sensitive fibres of the trifacial.

The author assumes both for ophthalmic zona and for ophthalmomalacia a common origin, which in the former affection follows preferably the ophthalmicociliary branches, and in the latter, the vascular branches of the ophthalmic nerve and its numerous sympathetic connections.

He has found that the treatment of the essential forms of ophthalmalacia is as unsettled as their pathology, although he advises the local use of such vasoconstrictors as cocaine and suprarenal extract.

Traumatic Paralysis of the Two Superior Oblique Muscles.

DEMICHERI, Montevideo. (*Annales d'Oculistique*, October, 1902). Demicheri reports the case of a twenty-one year old female whose medical history was negative. She fell downstairs, sustaining a fracture of the radius and the left superior maxillary bone with a contusion of the left brow. She was rendered unconscious by the fall and remained so for three days' time, when, except for a diplopia to be described, she recovered completely.

Examination showed normal vision in each eye, the right one being emmetropic and the left hypermetropic to about one-half of a diopter. The pupils and the fields of vision were normal. In the lower fields there existed a diplopia which was characteristic of paralyses of the two superior oblique muscles; that of the right eye being the more marked. Upon fixing with the left eye the patient became dizzy; due no doubt to having learned to orientate with the right eye which possessed the slightly better vision and which had alone been used at first on account of a bandaging of the left eye.

From the symptoms, fracture of the base could be excluded almost with certainty. Symmetrical lesions of the orbits and cavernous sinuses he states, would not have existed without other symptoms. Fractures of the cranial base, especially of the apex of the petrous portion or of the clinoid apophyses frequently cause paralyses of the sixth, the fifth, and the third pairs of nerves, but rarely of the fourth pair, which at no place lie in intimate relation with the base of the skull. A nuclear lesion was improbable, he says, since the intimate relations of the nuclei of the third and the fourth pairs make the isolated involvement of either difficult. At the apparent origin of the fourth pair at the valve of Velusseus, however, the

nerves cross, and a hemorrhage at this site is assumed by the author as the most probable lesion in his case. Several instances of unilateral paralysis of the fourth nerve, isolated or combined, with involvement of the other ocular nerves are reported, but none—except that of the author's in which there was a simultaneous traumatic paralysis of the two superior obliques—in his opinion is on record.

Treatment of Scintillating Scotomata.

CAPAUNER, Melhouse. (*Annales d'Oculistique*, October, 1902.) According to Capauner the etiology and the seat of the affection is uncertain: Charcot explained it as due to a vascular spasm situated in the cerebral cortex. Dufour was the first to call attention to a difference between negative and positive scotoma. The physician Plateau, though blind for forty years, had attacks of scintillating scotomata until his death and in his case the origin must have been situated in the cerebral cortex. In cases observed by Schneider, Galezowski, and others, the cause must have been retinal. The cephalalgia in these cases is usually located just above the eyebrows.

Having cured a case of simple cephalalgia located in this region by ocular massage, the author adopted the same method in scintillating scotomata. He has treated twelve cases with very satisfactory results by this method. He gives the history of three of them in which the attacks had continued for years, and in which relief from his plan of mechanotherapy has been permanent and complete. He says that the success of ocular massage renders the retinal origin of the affection very probable. The beneficial effects are attributed by him to the vascular changes which are induced not only locally but in a considerable part of the central circulation by a mechanical alteration of blood tension.

Regarding the Extripation of the Lacrimal Sac.

SALVA, Grenoble. (*Annales d'Oculistique*, October, 1902). Salva has performed extirpation of the lacrimal sac for dacriocystitis with dilation since 1895. Except in cases of marked dilation he does not cut the internal palpebral ligament. If section of the ligament has proven necessary he reunites the several portions while closing the wound.

He has found that hemorrhage is often abundant, but that it is always controlled by pressure. To aid in elevating the sac the author has devised a sharply curved flat hook. When drainage becomes necessary, the lower canaliculus is incised and gauze is introduced through the same, thus allowing primary intention of the cutaneous wound with a minimum degree of scarring. Usually an extirpation of the palpebral lacrimal gland is done at the same time. The author has never observed troublesome lacrimation to persist more than a few months' time. In irrigation of the wound after operation, slight pressure must be employed in order to avoid troublesome infiltration into the lids and orbit.

The author is favorable to the procedure. When it is refused, he fuses nitrate of silver onto the point of lacrimal probe and introduces it into the sac through the enlarged canaliculus; care being taken to avoid any burning of the conjunctiva. Five or six repetitions of this treatment at intervals of four or five days generally reduces the sac to its normal dimensions,

Embolism and Thrombosis of the Central Vessels of the Retina.

PANAS, Paris. (*Archives d'Ophtalmologie*, October, 1902.) Panas reviews briefly the history of embolism and thrombosis of the central retinal vessels. The sudden loss of vision, the characteristic appearance of the arteries and the diminution of the volume of the veins in a centripetal direction, the red spot in the fovea and the nebulosity of the surrounding retina, the absence of signs of stasis and the want of prominence of the papilla, he says, all speak for the complete obstruction of the central artery by an embolus, yet hemorrhage into the vaginal sheath and certain forms of acute retrobulber neuritis may produce similar changes. The anatomico-pathological examination also may often fail to establish a diagnosis, since after a few months' time the differentiation between an embolus and a thrombus becomes impossible, especially when it is remembered that the majority of the patients so attacked are of advanced age or are afflicted with some dyscrasia or disturbing factor such as syphilis, alcoholism, diabetes, or arthritis in whom arterio-sclerotic changes are marked. From the standpoint of general

pathology he has found that the occlusion of the vessels by thrombosis is much more common than that which is caused by embolism. During the past twenty-five years the diagnosis of the thrombosis, he says, has been supported by an increasing number of authorities, and such cases have been reported to a great extent! Haab in particular supporting thrombus as against embolism in arresting the circulation of the central retinal artery.

He reminds us that the occurrence of thrombosis of the central retinal veins has also been demonstrated by Michel. Of fifteen such cases reported ten developed glaucoma within two months after the attack of blindness, which he says, tends to prove that the venous thrombosis was not primary but was consecutive to a vascular disturbance arising from senile arteriosclerosis. In a case of this kind reported by Ischreyt, the examination of the eye which was removed for glaucoma showed a complete obliteration of the nasal branch of the vein by a thrombus with numerous points of obliterating endarteritis.

The diagnosis of venous thrombosis, he states, depends upon the usual retention of some visual power, the distention or (alternating distention) and contraction of the veins, and the absence of the venous pulse, the contraction of the arteries, and the frequent presence of retinal hemorrhages which are usually seen around the disc. The prognosis of venous thrombosis, he believes, is less serious than that of classic embolism.

As to the treatment of these affections, he says, that little can be done. He believes that mydriatics should be avoided upon account of the tendency to thrombosis.

Alcoholics should not be used. Iodide of potassium in small doses may be tried.

Amblyopia and Amaurosis from Electric Discharges.

PANAS, Paris. (*Archives d'Ophthalmologie*, October, 1902.) Panas reports the case of a young man of twenty-six years of age who was exposed at a distance of one-half of a meter to an electric discharge of five hundred and sixty volts. This exposure resulted in superficial burns of the face, intense dazzling of vision, and marked photophobia. During the following succeeding fifteen days the burns healed, but periorbital pains developed

On returning to work he found that his vision was so reduced that he was unable to continue.

Twelve days after the accident he consulted the author, when it was found that the vision of the right eye was reduced to one-sixth and that of the left eye to one-fourth of normal. There were also retinal hyperemia, contraction of the upper field of vision, and relative hemeralopia. Mercurial ointment to the temples, strychnine internally, and colored glasses were prescribed. Two months later cure was almost complete.

He tells us that among the symptoms reported by other writers as the result of similar exposures are corneal haze, miosis, paresis of the right internal rectus muscle, paralysis of accommodation, iridocyclitis, partial optic nerve atrophy, bilateral cataract, intraocular hemorrhages, and retinal detachment. In some cases hysterical amblyopia has been noted. The variability of the symptoms depends, he says, upon the intensity of the electric discharge as well as upon the degree of impressionability of the subject; the latter element being quite prominent and explanatory why such accidents are particularly frequent in those who are predisposed to hysteria.

Ocular Autoplastics.

BADAL, Bordeaux. (*Archives d'Ophthalmologie*, October, 1902.) Badal reports two cases in which he practiced ocular autoplasty by a method which he ascribes to Teale. The operation consist in taking a bridge of either conjunctiva or of cutaneous tissue, as the case may be, from the upper or lower bulbar surface or upper lid to the lower to remedy losses of tissue. The ends of the flap are made to extend to the horizontal meridian through the center of the cornea or through the ends of the palpebral fissure in such a manner as render their separation unnecessary after suturing them into the bridge of tissue thus transposed.

Vernal Catarrh.

DEMICHERI, Montevideo. (*Archives d'Ophthalmologie*, October, 1902.) Demicheri reports a case of vernal catarrh occurring in a young man of twenty-five years of age who had been irregularly under observation for a period of four years, with but slight resultant change in the ocular condition. There were not any alterations of

the bulbar conjunctiva and but a slight milkiness of that of the lower lid. On everting the upper lid its tarsal portion alone was found to be affected. Along the superior tarsal margin there was a row of large smooth whitish papules which were hard and flattened, lying in close apposition. The remainder of the tarsal conjunctiva, except where it was covered by an immense flattened papule on each side, had the smooth milky appearance of vernal catarrh. Extirpation and cauterization of the bases of the large masses were twice performed and in each instance was followed by an immediate return. Microscopic examination of the excised portions revealed a true papillomatous structure covered with a massing composed of a marked increase in the number of epithelial layers. Cellular infiltration of the deeper layers was slight in contradistinction to the nodular infiltration which is found in the so-called false papillary structures of trachomatous origin. The author has observed twenty cases of vernal catarrh: In three, pericorneal hypertrophy alone occurred; in nine, the superior lid was alone affected; and in eight, the involvement was complete. The important diagnostic point between vernal catarrh and trachoma, he claims, is the absence in the former of any disturbance in the superior cul-de-sac.

As to treatment, the author uses calomel, with white precipitate and cocaine. He states that also to be mentioned are adrenalin, scraping, and electrolysis,

Acute Dacrioadenitis Consecutive to the Ingestion of a Small Dose of Iodide of Potassium.

PRIOUT, Reims. (*La Clinique Ophtalmologique*, 10th October, 1902.) Priout reports a case in which the daily ingestion of eighteen grains of iodide of potassium for a period of nine days produced the classical symptoms of acute dacrioadenitis, and in which relief was rapid upon the cessation of the use of the drug. He ascribed the inflammatory action to the irritation produced by the iodine during the elimination by the gland.

Congenital Symblepharon with Coloboma of the Lid.

DUJARDIN, Lille. (*La Clinique Ophtalmologique*, 10th October, 1902.) Symblepharon of the lids. Dujardin says, is very rare as a congenital anomaly. Mackenzie, he tells us, mentions two cases without reporting them. Osio has

reported a case in which there was coloboma of each upper lid in a child of four months. The condition was associated with abscess of the cornea on the right side and bulbar atrophy on the left. He ascribed the change to intrauterine inflammation. Dujardin reports the instance of a child of six weeks of age, of a healthy parentage, in which there were small corneal leucomata at upper inner corneal limbus of the left eye and the lower inner limbus of the right eye. There was also a V shaped coloboma of the right lower lid. From the apex of this coloboma to the leucoma there extended a fold of whitish membrane. In this case as in that of Osio, intrauterine inflammation was advanced in explanation of the presence of the coloboma. Adhesions were presumed to have formed between the cornea and the lid with the production of a defect in the lid by a constant tugging upon the globe. No cause of the intrauterine ocular inflammation was apparent.

Traumatism of the Eye and Keratoconus.

KOPFF, Paris. (*Revue generale d'Ophthalmologie*, 30th September, 1902.) Kopff notes a case of this condition in which after a violent blow with slight injury to the cornea of one eye by some flying dust, grave nervous symptoms with the developement of marked bilateral keratoconus occurred. He cites a case of his own in which marked unilateral keratoconus gradually developed after a blow on the eye by a fist.

In view of the great difficulty often experienced in determining the cause of keratoconus the author believes the above cases may be of interest

The Treatment of Myopia.

LIEBREICH, Paris. (*Annales d'Oculistique*, November, 1902.) Liebreich is convinced that the development of myopia is usually the result of an increase of the inter-pupillary distance due primarily to a too great separation of the inner orbital walls. This malformation of the osseous structure, he says, is the essential hereditary element of myopia, which gives rise to a disturbance of the relations between accommodation and convergence by an increase of the angle B. Therefore he considers prisms combined necessarily with other precautions as to light, position, etc., as the only positive remedies against the progress of the condition. In the prodromal stage of my-

opia he uses only weak prisms. In more advanced cases he adds concave lenses. He believes that the total correction of myopia succeeds only in those cases in which the angle B is either small or normal: Conversely, he thinks that the convergent squint of myopia is due to a diminution of the angle.

Remarks on the Conjunctival Vegetations of Vernal Recrudescence: Their Structure and their Treatment.

TERSON, A., Paris. (*Annales d'Oculistique*, November, 1902.) Terson reviews the literature of this affection and makes the following personal observations. Either the corneal or the tarsal types exist largely to the exclusion of the other. In his series, catarrh appeared at the end of Spring and the secretion was of various kinds. An unilateral case was never observed and but one in which there was an adenitis. The disease occurred principally among those subjects who lived in the country, and was most frequently found between the ages of six and fifteen years. Eighty-five per cent. of the cases were males. Histological examination of the growths showed them practically to consist in attenuated papillomata, this finding being supported by the fact that they only occurred at those sites at which papillae are normally found. No specific bacterial origin could be determined, though the question of endoinfection was repeatedly raised. The author has found a two and a half per cent. strength ointment of yellow oxide of mercury in lanolin or in "oil of vaseline" to be very efficient. Protargol, and hot and cold applications, cocain, suprarenal extract, colored glasses, and treatment of nasal affections, should all be tried. Locally, he performs partial or total excision: He considers galvanopuncture as the best destructive measure. The internal use of arsenic, as recommended by De Wecker, he has used most successfully.

The particular case mentioned by him, relapsed and later developed a severe attack of eczema, during which the ocular trouble disappeared. Schiele, he says, considers the condition as one of chronic eczema of the conjunctiva.

Unilateral Ophthalmoplegia; Extrinsic or Intrinsic from Vascular Lesions.

FERRON, Toulouse. (*Annales d'Oculistique*, November,

1902.) Ferron concludes his paper with the following deductions: I. From anatomical and clinical studies demonstrating the existence of a partial decussation of the oculomotor fibres, it is difficult, or even impossible, to conceive of the existence of an unilateral extrinsic ophthalmoplegia, having a lesion of nuclear origin as the cause.

II. As pathological anatomy and clinical studies prove the existence of partial paralysis of the oculomotor nerve and of unilateral extrinsic or intrinsic ophthalmoplegias having a basilar lesion for a cause, it is therefore easy to contradict the generally accepted opinion that basilar ophthalmoplegias are always mixed in character. On the contrary, it is rational to admit the existence of unilateral extrinsic or intrinsic ophthalmoplegias, which are produced by lesions which are situated at the base of the brain.

Nicotine Amblyopia.

GALTIER, Nîmes. (*Annales d'Oculistique*, November, 1902.) Galtier quotes a case and cites one of his own to demonstrate that abstinence from the toxic agent is not always an efficient method of cure. In his own case abstinence for twenty months failed absolutely to give any result. Pilocarpine was administered, completely relieving the patient of a reduction of vision to one-sixth of normal with a color scotoma.

He reminds us that Coursevant advised the use of pilocarpine some twenty years ago.

A Case of Malignant Pterygium with Relapses Leading to Blindness.

GONIN, Lausanne. (*Annales d'Oculistique*, November, 1902.) Gonin reports a case in which several relapses of a pterygium led to a complete veiling of the cornea. All efforts to discover the pathogenesis of the growth and any especial dyscrasia were ineffectual. A condition of "pterygiosus" was advanced to explain the disease.

Congenital Ptosis, So-Called.

PANAS, Paris. (*Archives d'Ophthalmologie*, November, 1902.) Pseudocongenital ptosis, Panas says, is characterized by unilateral location, relative fall of the lid during elevation of the brow, and indelible wrinkles of the forehead due to reflex atrophy of the muscular tissues and perhaps the elastic fibres of the skin. He describes

his well known method of operation for ptosis and also that of Motais. He suggests a modification of the Motais method which consists in buttonholing the lid at the superior tarsal border and fixing the flap from the superior rectus muscle in that position by a suture made to pass through the suspensory ligament above and through the tarsus below, so as to include the conjunctiva, the orbicularis, muscle and the skin. Morax, he says, practiced two modifications of the Motais operation: of passing a suture through the middle part of the superior rectus muscle and of tying the suture on the cutaneous surface of the lid near the ciliary margin over a roll of cotton in order to prevent scarring. Panas reports a case of congenital ptosis upon which he operated by the classical Motais method and in which the results were incomplete and associated with a marked insufficiency of the superior rectus muscle. He tells us that in spastic ptosis it is well to try the effect of massage and electrization of the drooping lid combined with mechanical separation of the lips of the palpebral fissure before resorting to operative methods.

On Certain Benign Neoplasms Having the Free Border of the Lids for their Seat.

PANAS, Paris. (*Archives d'Ophthalmologie*, November, 1902.) Panas reports the following case. On the inner margin of the free border of the lid of a twenty-eight year old female there was situated a smooth soft semi-translucent tumor which was of the size of a pea and pedunculated. At the base of the tumor there was a small scar. At times, on closing the lids, a slight hemorrhage flowed from the extruded tumor. Histological study of the growth showed it to be a simple granuloma containing considerable pigment, the remains of repeated hemorrhages. This view of the character of the mass was borne out also by the innocent mode of its development.

The author reviews the literature of this type of growth, and finds reported one papilloma, one fibropapilloma, one cavernous lymphangioma, one adenoma of the pilosebaceous glands, one adenoma of the sudoriparous gland, one adenoma of the meibomian glands, three granulomata,

and a few serous cysts arising from the sudoriparous glands.

The treatment of the tumors he says, consists in simple excision.

Their diagnosis from the malignant forms of neoplasm depends on the progressive involvement, the plaque-like shape, and the ulcerative processes. Malignant involvement of the Meibomian glands, he says, is to be diagnosed by a microscopic study of the excised portions, inoculation of animals, and a consideration of the more rapid course.

The Prognosis of Visual Disturbances of Electric Origin.

TERRIEN, Paris. (*Archives d'Ophthalmologie*, November, 1902.) Terrien reports forty-five cases of ocular disturbances as the result of exposure to powerful electric flashes of light resulting from short circuits. In only one of the cases did the current pass through the patient's body. He divides the symptomatology into three forms: first, inflammatory phenomena; second, functional conditions; and third, nervous disturbances. The inflammatory phenomena consisted in redness and swelling of the skin lasting a few days' time and (in three cases) burns of the skin, eyelashes, and eyebrows. Hyperemia of the conjunctiva was always present with rarely a chemosis, and edema of the lids with pericorneal injection. In a few days' time a true conjunctivitis followed, accompanied with a mucopurulent secretion. Corneal disturbances were not noted, though other authors have reported the same. Hyperemia of the iris often occurred and disappeared in a few days. Lenticular changes were not found although they have been reported by others. Alterations in the optic disc and retina similar to those occurring in specific neuroretinitis were almost always present.

The first functional disturbance observed was a dazzling which followed immediately and lasted a variable period of time, this depending, upon the intensity and the distance of the spark and the susceptibility of the individual. The dazzling lasted from a few minutes' to two hours' time, when vision partly returned. During the period of absolute dazzling, erythropsia was common and lasted for

several minutes. Diminution of vision and a lessening of the size of the visual field usually went *pari passu*.

Of the author's series of cases, seven per cent. sustained a gross and permanent impairment of vision, while in fourteen per cent the visual loss was less grave. Difficulty of fixation and asthenopic symptoms were frequent, and at times continued after vision had returned to normal. Hemeralopia was a quite common symptom. The main functional disturbances consisted in photophobia which was probably dependent upon an edema of the retinal layers with changes in the ganglion cells.

The nervous disturbances consisted in photophobia which was generally in direct relation with the degree of severity of the lesions. Cephalalgia was almost constant during the first few days, while neuralgic pains in the globe or in the periorbital region (and often very severe) developed at variable periods of time after the accident. These pains were not continuous, but occurred in crises, and were usually worse at night. In benign cases they were generally absent. Tenderness of the globe or of the supraorbital nerves occurred in pronounced cases and were of prognostic value. Of motor disturbances blepharospasm was the most constant. The pupil was generally contracted immediately after the accident, and recovered its proper size in a few days' time. In the severe cases the iris was paretic and though reacting feebly to light, the pupil expanded again in spite of stimulation: this phenomena, he says, is of prognostic value. Secretory disturbances comprised only lacrimation.

The diagnosis of the nature of the affection is rarely in doubt. Simulation, he states, does occur, but the fundus examination and the fixed diminuation of the visual fields serve in determining the real condition. Whether the case is one of traumatic hysteria or one of real organic change may be impossible to say, but is of little medicolegal importance.

The prognosis of the affection is a difficult and delicate matter. The duration of the symptoms is of more importance than the question of the degree of initial severity. Paretic irides, contracted fields, severe neuralgic and pressure pains, and slow improvement of the vision, all point toward a grave form of the affection.

Treatment should be prophylactic, but this in measure is impracticable; the wearing of colored or smoked glasses renders work practically impossible. For the ocular pains, cold compresses, and cocaine may be used. For the neuralgic pains, bromide of potassium, quinine and antipyrin may be employed. For the functional disturbances, nux vomica, nitrite of amyl, lactate of zinc, and electricity may be tried; but too often unfortunately, with but little result.

Oily Cysts in the Orbital Region.

PANAS, Paris. (*Archives d'Ophthalmologie*, December, 1992.) Panas tells us that these oily dermoid cysts were formerly confused with the so-called "atheromes" which affected especially the scalp; the mistake being due to an analogy of the contents. In the 'atheromes' however, there is an absence of glandular as well as of muscular and elastic elements, and the summit of the mass is intimately adherent to the overlying skin. Dermoids, on the contrary, are situated preferably at the sites of the branchial fissures. The name of oily cysts is given to a type of dermoids in which the sac distinctly fluctuates, is smooth, tense, often transparent, and the contents of which are almost exclusively oleagenous. The deepest portions of the cyst are often adherent to the adjacent periosteum and consist of the true elements of the skin. The anterior pole is much thinner, often denuded of its epithelial layer, and is much poorer or entirely lacking in glandular elements. Almost all of these cysts are located in the orbital region, preferably in the prelacrymal portion. Malignant degeneration of the circumorbital dermoids in general is rare.

The author reports a case of circumorbital oily cyst and cites four others. In three of the cited cases the cyst was prelacrymal in situation, while his and the remaining one were situated at the external angle. The diagnosis of the cysts, he says, is not difficult. Confusion with a meningocele is only possible when the cyst is situated near the glabella. In cases of doubt, exploratory puncture should be made. Prognosis is very favorable and the treatment consists in removal of the mass by dissection.

Syphilis of the Lacrimal Passages.

PANAS, Paris. (*Archives d'Ophthalmologie*, December, 1902.) Panas reports the case of a male of forty-five years of age who presented himself with a large ulcerating fungus growth in the region of the left lacrimal sac. A definite history of syphilis was obtained and mercury by intramuscular injections and by inunction was ordered. In eight days' time the growth had partly cicatrized.

Syphilitic involvement of the lacrimal tracts by primary or secondary lesions, he says, is much more rare than by those of the tertiary stage. These types of syphilitic tumors, he believes, may be confused with cancerous, sarcomatous, and tubercular growths. Carcinoma of the sac is relatively rare and is almost always consecutive to involvement of the internal angle: Sarcoma is quite as uncommon; while tubercular involvement of the lacrimal glands may also occur.

Syphilitic Dacrioadenitis.

DE LAPERSONNE, Paris. (*Archives d'Ophthalmologie*, December, 1902.) De Lapersonne reports the following cases. I. A forty-two year old man who was an alcoholic. He gave a history of gonorrhea twenty years before; but none of syphilis. A few weeks before being seen he had developed an acute double dacriocystitis, when slowly subsided leaving indurated glands. This adenitis was followed by a severe iritis and a chorioiditis with multiple adenitis of the seminal, mammary, and parotid glands. Specific treatment was not very efficient. A diagnosis by exclusion, he says, renders the syphilitic origin of the affection probable. The second case was one of primary lesion of the lid associated with a painless swelling and induration of the lacrimal gland of the same side.

A New Mydriatic, Bromide of Methyl-Atropine; a Drug Capable of Replacing Homatropine and Euphthalmine.

DARIER, Paris. (*La Clinique Ophthalmologique*, November, 1902.) Darier concludes his article as follows: 1, Bromide of methyl-atropine is a valuable adjunct to atropin in that it lacks certain inconveniences of the latter drug and it possesses new qualities; 2, In increased and repeated dosage it has the same action on the iris and

ciliary muscle as the sulphate of atropine; 3, In medium doses (one per cent. strength) the mydriasis produced by it may last slightly more than twenty-four hours, while the resultant paralysis of accommodation lasts but a few hours' time; 4, In weak doses (one-half per cent. strength) combined with one per cent. strength of cocaine, mydriasis alone is produced.

Universal Electroscope for the Ophthalmologist.

ASCHER, Frankfort-on-the-Main. (*La Clinique Ophthalmologique*, November 10, 1902.) Ascher describes a portable dry cell electric light, the frame of which is provided with discs containing variously sized openings and differently colored glasses. With this lamp, ocular illumination is easy, while study of the fields of color-perception is readily accomplished.

Protargol, its Uses for Two Years Past in the Charlotten Heilanstalt of Stuttgart.

RUFFEL, Stuttgart. (*La Clinique Ophthalmologique*, November 10, 1902.) Ruffel has employed protargol in eight hundred cases and has found it to be a most active agent in the treatment of conjunctival affections which are combined with abundant catarrh. In dacriocystitis he has obtained the best results by instillation of the drug in from ten to twenty per cent. strength solutions followed by massage of the canaliculi. In moderate and mild cases of ophthalmia neonatorum the drug may be made to replace nitrate of silver and may completely take the place of the latter material in the employment of Créde's method. He has found that a ten to twenty per cent strength solution of protargol is equal in action on the gonococcus to a two per cent. strength solution of nitrate of silver, while its action is more lasting and less irritating.

A Case of Actinomycosis of the Right Inferior Lacrimal Canaliculus.

GUIBERT, La Roche son Yon. (*La Clinique Ophthalmologique*, November 10, 1902.) Guibert reports a case in which, in a leather worker of thirty-four years of age, a small inflammatory in the region of the inferior canaliculus appeared. The usual incision of the latter allowed the escape of a small tubulated grayish yellow concretion which consisted of numerous pin-sized globules.

Convalescence was uneventful. Microscopic examination of the material showed typical actinomycotic structures.

Note on the Action of Electric Heat and of Dionin in Rheumatic Affections of the Eye.

MADDOX, Bournemouth. (*La Clinique Ophtalmologique*, December 10, 1902.) Maddox has found that the best method of applying artificial heat to the eye is by means of a half to a seven-tenths strength ampere current passed through a very fine wire which is wrapped around a roll of canton flannel. The current, he says, can be taken from an ordinary lighting wire and controlled by a transformer. The employment of dry heat he believes is especially indicated in rheumatic affections of the eye and in certain forms of glaucoma. The indications for the use of dionin are still unsettled. As a rule the drug should be employed when heat is indicated, while adrenalin is useful when cold is the more applicable.

Atrophy of the Optic Nerve and Microphthalmus Consecutive to a Lesion of the Optic Nerve During Labor.

KOPPEN, Marburg. (*La Clinique Ophtalmologique*, December 10, 1902.) Koppen reports a case of optic atrophy and microphthalmus which undoubtedly was the result of a forceps injury during labor. After the birth of the child the eye protruded from the orbit and the corresponding lids and cheek which were swollen, were covered with blood. Presumably the optic nerve was torn by excessive tension.

Grave Accidents Provoked by the Use of Iodide of Potassium in the Treatment of Manifestations of Syphilis.

ABADIE, Paris. (*La Clinique Ophtalmologique*, November 25, 1902.) In two cases of recent syphilis treated by injections of calomel and with iodide of potassium, Abadie has seen the symptom-complex of hemorrhagic glaucoma develop. He has found that such symptoms were much more severe in a case which was taken large doses of the drug and that the condition only receded upon stopping its use and employing injections of cyanide of mercury. In two of the cases which had been under mercurial treatment, the addition of iodide of potassium to the list of remedies used caused an immediate aggravation of all of the symptoms.

On the Treatment of Detachment of the Retina.

JOCQS, Paris. (*La Clinique Ophthalmologique*, November 25, 1902.) Jocqs briefly reviews the discussion de Wecker and L. Dor on the technique of subconjunctival injections. Dor, he says, claims to make the injections under the capsule of Tenon, while de Wecker believes the so-called subconjunctival injections are in part subtenous, but do not remain so because of the incomplete closure of this space. As yet no method, he tells us, of rendering the injections of concentrated fluid painless has been discovered. De Wecker, he says, has reported that the employment of the vitreous humor of animals as a solvent attains such an end.

The author first evacuates the subretinal fluid with a narrow von Graefe knife and then makes the subconjunctival injection. He quotes a case which has been reported by Thilliez and in which rapid cure followed a triple subconjunctival injection of a thirty-three per cent. strength solution of chloride of sodium combined with three drops of a one per cent. strength solution of aconitine, in association with the observance of absolute decubitus for two weeks' time.

Remarks Concerning the Article Of Dr. A. Terson on the Oily Collyria.

SCRINI. (*La Clinique Ophthalmologique*, November 25, 1902.) Scrini gives an historical account of the use of oily collyria, and shows that Deval was not the first to prescribe them. At present, oily collyria, of the alkaloid bases, he says, are alone used, the salts of the metals being insoluble in this medium. The oily collyrium of eserine in one per cent. strengths is now well known for the tolerance with which it can be borne and for its efficiency.

A Case of Parenchymatous Keratitis of the Sclerosing Form Probably of a Tuberculous Nature: Remarkable Action of Jequirity on the Leucomatous Cornea, and of Subconjunctival Injections of Hetal on the Recently Attacked Eye.

DARIER, Paris. (*La Clinique Ophthalmologique*, December 10, 1902.) Darier reports a case of parenchymatous keratitis in a scrofulous child in whom jequirity measurably cleared a leucomatous cornea of one eye, while on the other side, after an absolute failure of mercurial injections for systemic effect, and of various topical appli-

cations (mercurialized lanolin, atropine, etc.) improvement of vision from one-hundredths to one-eighth of normal followed the employment of eleven subconjunctival injections of Hetal.

This drug he reminds us, is a cinnamate of soda which is frequently employed of late in treatment of general tuberculosis.

ABSTRACTS FROM AMERICAN AND ENGLISH
OPHTHALMIC LITERATURE.

BY

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NEW YORK,

AND

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(Quarter ending December 31, 1902.)

Contribution to the Etiology of Myopia.

WIDMARK, J. E., Stockholm. (*Brit. Med. Jour.*, Nov. 1, 1902.) In attempting to explain the origin of myopia, attention has been fixed mainly on accommodation and convergence, but much importance has been ascribed to seeing in its limited sense, that is to say, the perception in the retina and the connected processes at the posterior pole of the eye. "The opinion that accommodation plays any important part in the origin of myopia, seems now to have been given up by most authors. On the other hand, the theory of convergence has gained many adherents. Meanwhile, cases of myopia are often met with in practice which cannot be explained by this theory. That which especially has aroused my doubts on this point is the different effects which corneal opacities and astigmatism appear to exert on the development of myopia, whether they occur only in one eye or in both. That opacities of the cornea appearing in childhood favor the development of the myopia is a well-known fact. So it seems also to be with astigmatism, the predisposing importance of which for the development of myopia has been made probable by the investigation of Javal and Nordenson. Opacities of the cornea and astigmatism lead to myopia, probably because

they reduce the vision and so render close work more difficult. But if corneal spots and astigmatism occur in one eye only, it is, according to my experience, the other sound eye which is in the first place affected with myopia, and when astigmatism in different degrees affects both eyes, myopia is developed particularly or exclusively on the least astigmatical eye."

After relating the histories of a number of instances of this sort, the writer analyzes 100 cases of anisometropia selected from 6000 cases in private practice. In 49 of these astigmatism was confined exclusively or principally to one eye. Among these the myopia was confined to the least astigmatic eye in 41 instances. This is explained by the fact that the eye which possesses the better sight (least or not all astigmatic) is the eye which is most used in close work. The same explanation can be applied to the cases of myopia in the one eye, and corneal spots or strabismus in the other.

"As to the opinion that convergence would lead to myopia by causing a strain on the optic nerves at the posterior pole of the eyeball, I have measured the punctum proximum of convergence in all cases of myopia in my private practice during the latter years. The method I have employed is based on the same principle as those used by Priestly Smith, Maddox, Hirschberg, and Gullstrand for other purposes, namely, the different position of the corneal reflex when the eye is fixing a flame or when it is deviating.

The little instrument I have used has the form of a little rectangular wooden hook, with a small hole just at the angle. A lighted wax match is put into the hole, and the instrument is advanced to the patient's fixing eyes, gliding on a metre scale, which leans against his cheek. As soon as the one eye deviates outward, the corneal reflex seem to glide inward. The distance when this takes place can immediately be measured on the metre scale. The result of my investigations has been that, out of 100 cases of myopia, there were 81 who converged to at least 5 cm., and among these were cases of myopia up to 18 D.

This speaks in its way against the theory of convergence for it is very improbable that a strain on the optic nerve at the usual distance for reading (or about 30 cm.) would be

produced if the eyes are able to converge to 4 to 5 cm.

The direction of the posterior staphyloma also seems to me to speak against the theory of convergence. When the eyes in reading, etc., are turned downward and inward, the strain at the posterior poles must make itself felt outward and upward. But the direction of the posterior staphyloma is commonly outward and downward.

On the ground of these observations, I think I may enunciate the following thesis:

If by any cause the sight of the one eye is weakened in early childhood, myopia is developed exclusively or principally on the other (strong) eye, whether the first-named takes part in fixation or passes on to convergent or divergent strabismus. If one of the eyes is lost a typical myopia may be developed in the remaining eye.

Convergence equally with accommodation is, therefore, not one of the most important factors in the origin of myopia, for the myopia can arise independently of all convergence. The chief cause of myopia is "seeing" in a limited sense; the perception in the yellow spot and the processes connected therewith at the posterior pole of the eye. What these processes may be is not easily decided. But it seems to me not impossible that the effort of discerning the objects quickly following on each other—as, for instance, the letters in writing or reading—might lead to the hyperemia at the bottom of the eye, which some theories assume as a predisposing cause of the myopic changes at the posterior pole of the eye.

Accumulated products of fatigue may also have a deleterious influence on the membranes. Hyperemia on its side may lead to softening of the tissues which yield to the intraocular pressure. In more advanced cases the hyperemia and the products of fatigue may lead to more serious changes of an inflammatory or atrophic character.

If the opinions here expressed are right they have undoubtedly practical importance. The school myopia is to be prevented only by facilitating the work of the retina. All measures which have another aim are more or less unimportant.

I will, however, by no means deny all importance of convergence. On the contrary, I am always very careful in my practice to facilitate the convergence by means of

corrective glasses for myopic patients, specially in cases of muscular insufficiency. But I think that glasses are useful not by lessening the pressure of the muscles on the eyeball or on any of the vortex veins, or by lessening the strain on the optic nerves at the posterior pole of the eye, but chiefly by facilitating binocular fixation and thus contributing to a clear image of the fixed object in the central fovea. Moreover, correcting glasses improve the position of the body during work at school, and extend the distance for accommodation. Thus I generally give myopic patients fully correcting glasses if accommodation and acuteness of vision are good. Still I cannot find that an artificial emmetropia, affected by correcting glasses for the same eyes which the natural emmetropia has not been able to prevent from becoming shortsighted, should entail the strong protection against progressive myopia which from many quarters has been contended."

The Genesis and Treatment of the Myopic Eye.

RISLEY, S. D., Philadelphia. (*Journal Amer. Med. Assn.*, November 22, 1902.) "Myopia can not be regarded as either a physiologic or sociologic evolution, but is to be viewed as one of the many baneful results of civilized life over the physical well-being of the race. The problem presented for solution is its prevention."

As to its genesis, the rapidly increasing percentage of the disease during educational processes led to the correction of the bad hygienic environment of the school room; as to lighting, construction of desks, seats, paper and type used in school books; but this produced no notable difference. The writer's report of the school statistics in 1881, shows the following interesting and important facts bearing on the genesis of the myopic eye.

"First. The emmetropic eye not only remained in a nearly uniform percentage through all ages of school life, but enjoyed the highest acuity of vision and was relatively free from pain and disease.

Second. The eyes with a simple hypermetropia stood next to emmetropia in all these respects.

Third. The eyes with hypermetropic refraction, especially where astigmatism was present, manifested symptoms of asthenopia, lowered acuity of vision and pathologic states of the fundus; notably irritative and absorp-

tion changes throughout the fundus, granular changes at the fovea and crescents of chorioiditis at the temporal margin of the optic disc in all stages of development from a faintly outlined crescent to far advanced atrophies which had before been regarded as physiologic anomalies when seen in hypermetropic eyes, but as pathologic if associated with myopic refraction.

Fourth. It was shown, as had been demonstrated by all observers, that not only did the myopic eye increase in percentage during school life, but that there was a closely corresponding diminution in the percentage of hypermetropia. This group of facts seemed to afford a sufficient demonstration for the conclusion that the myopic eye, with its characteristic pathologic changes in the fundus, was but a later stage of the conditions witnessed in the eyes with hypermetropic astigmatism, hence that the former was recruited from the latter.

Fifth. In the very large percentage of congenitally defective, that is to say, eyes with hypermetropic astigmatism which were shown to exist in the schools, we have, therefore, a sufficient explanation for the steadily increasing percentage of myopia notwithstanding the improved environments of the school room.

We have, therefore, primarily a congenital anatomical anomaly as the starting point or basis for the chain of events we have been considering."

The treatment resolves itself into two factors:

"First, attention to the pathologic conditions, second, the careful correction of the anomaly of refraction and accommodation and any of the associated abnormalities of ocular balance."

It is urged that no final attempt to prescribe correcting glasses be made until the fundus conditions upon which the progressive myopia depends are under control by complete rest under mydriatic, smoked glasses, temporary non-use of correcting glasses and the internal use of potassium iodide and bromide with bichloride of mercury, iodide of iron, etc., with careful attention to general regimen. Then the careful painstaking correction of the refraction of each eye followed by adjustment of binocular balance by prisms or tenotomy.

The writer invariably prescribes full correcting lenses

for myopia of 12 D. or less, "but if the myopia is higher than 4 to 5 D., under correcting glasses are given for near work," the far point depending upon age, power of convergence, and the nature and amount of work required; the condition of the fundus and tendency to progression of the disease.

The Correction of Myopia.

FRIEDMANN, A. C., Colorado Springs. (*Ophth. Record*, November, 1902.) Having been an assistant of Koenigshoefer's naturally followed his principle of under correction in myopia, whose rule was "to correct every myopia from one diopter upward so that the lenses were about one or one and one-half diopters below the absolute myopia if the comfort of the patient allowed them to do so and if there were no affections of the fundus."

Concave glasses above 10 D. were prescribed only exceptionally; and for theaters and observation cars, etc., patients were allowed to wear a lorgnette as a supplement. For reading a lens two and a half diopters weaker than that given for distance was given them in order to enable them to see plainly up to 40 cm. Astigmatism and muscular insufficiency were always carefully considered and mydriatic used thoroughly.

The strongest point in favor of full correction is the possibility of diminishing the progression of myopia; formerly the age from 14 to 21 years was considered the most dangerous, now that from 6 to 15 years is far more dangerous. The degree of myopia is an important factor, cases of more than 10 D. showing a tendency to pernicious progression. Heredity and occupation are features to be considered.

A letter from H. Knapp is appended who considers full correction the proper treatment where no dangerous fundus changes are present. Where there are, his rule is to enable such people to read 20/LXX and let them wear these glasses for ordinary purposes allowing full correction for galleries, theaters, etc. Persons who have used full correction in their younger years are advised an under correction for fine, near work when they are 38 years of age or more.

The Full Correction of Myopia.

JACKSON, EDWARD, Denver. (*Ophth. Record*, Novem-

ber, 1902.) "The tendency of myopia to increase is not the only thing about it that needs to be combatted." "All cases are, at some stage of their history, progressive." This increase is closely related to those degenerative changes that constitute its other chief dangers

The greatest service that can be rendered a myope is to permanently check the tendency to increase of refraction; the next service of importance is to remove, in large measure, the disability myopia, causes, i. e., enable him to see approximately as an emmetrope.

"For the great mass of myopes both of these services are rendered, by fully correcting their myopia and instructing them to wear their correcting lenses for both distant and near vision."

A report of 62 cases including 123 eyes is made which have been followed and carefully remeasured after periods varying from 3 to 17 years, the average being 5 $\frac{2}{3}$ years.

Of these 123 eyes 93 have remained without change in the amount of their myopia, or the increase or diminution in the myopia has been less than 0.50 D. In 10 eyes the myopia increased 0.50 D. In 3 eyes the myopia diminished 0.50 D. In 13 eyes the myopia increased more than 0.50 D., the average increase being 1.50 D. In 4 eyes the myopia diminished more than 0.50 D., the average diminution being 1. D. The percentages are:

Stationary75.6 per cent.

Increased18.7 per cent.

Diminished 5.7 per cent.

In but 6 eyes of the whole series was the acuteness of vision diminished to even the slightest extent; and in none of these cases did the loss amount to more than the perception of one line of letters, as from 4-4ths. to 4-5ths. On the other hand there was marked improvement of the visual acuteness of 16 eyes, under the constant wearing of correcting glasses; and for some eyes the acuteness of vision was doubled."

The efficiency of full correction for rendering myopia non-progressive is most noticable when applied to young myopes as a statistical table of 35 eyes of patients all under 20 years of age shows.

"It will be noticed that these patients remained under

observation for periods varying from 3 to 11 years, the average being 6 years. Of these 35 eyes, 60 per cent, never became more myopic after beginning to wear correcting glasses; and while in 14 eyes the myopia at some time increased more than 0.25 D., in 4 eyes it diminished more than that amount."

"In nearly all of the cases that showed any increase of myopia there were periods when it remained stationary. Then after some special strain the myopia would become progressive, and would continue so until it was re-corrected; when it would again become stationary."

The writer knows of no statistics as extensive as these that can be said to point to an essentially different conclusion.

"The most important cause of myopia appears to be the pressure on the globe of the extraocular muscles. This is greatly increased by use of the eyes for near work, and the uncorrected myope can use his eyes for nothing else. To permit and encourage the comfortable use of the eyes for distant vision, is the first indication to be met in the treatment of myopia. It is met by the constant wearing of the full correction, and in no other way. This theoretical consideration is fully supported by all published experience, and until opposing experience of quite a different order from any now extant has been brought before us, we are justified in holding that this point in the treatment of myopia has been settled. Of exceptions to the rule of full correction, I have elsewhere written at length. They exist and must be recognized, but they do not detract from the great importance of the rule."

A Modified Form of Test Card and Test Letter.

STARR, ELMER G., Buffalo. (*Journal Amer. Med. Assn.*, November 8, 1902.) "The question of illumination, the position of test types with reference to patient and light, and even the arrangement of the case of test lenses, all are worthy of attention. Since, with few exceptions, our final determination of the refraction is made with test lenses and test types or letters, these occupy the place of chief importance: in this work no great change in the way of improvement has been made in test-letters since the classical work of Snellen in 1862."

The test card as ordinarily employed produces from the

glare of light reflected from its white background a fatigue of the eye and lessening of the sensitiveness to slight changes in distinctness of outline of small test letters; the card devised by Dr. Gould, white letters on a black ground, produces the effect of irradiation seen about the letters.

Gardner has devised a series of letters made up in colors on a ground of different color, usually yellow and blue, being complimentary colors, which makes the letters more sharply defined, the fatigue of the eye from the reflected glare being lessened and the letters are more brilliantly outlined.

A Practical Color-Test.

SCOTT, KENNETH, London. (*Medical Press & Circular*, December 17, 1902.) "This test is essentially for the practical purpose of proving the efficiency, or otherwise, regarding the correct appreciation of color, of those wishing to be employed on railways, in navigation, or any other occupation, where directions are conveyed at times by signals formed of colored lights. It is the power of instantly and correctly recognizing the colored lights so employed, and not the relative comparisons of tints or shades of color, which is required from such individuals. The test now described does not replace or supersede the more minutely detailed examination for color-perception, either qualitative or quantitative, which may be additionally investigated whenever necessary.

As only four colors are ordinarily used when signalling with lights, the colors in this test are similarly limited; and when the examiner is satisfied that these can be quickly and correctly recognized in a practical manner, there can be no hesitation in stating that the individual under question is perfectly qualified, in this special particular, for employment in any of the avocations just mentioned.

The colors referred to are a bright white or clear yellow light, also red, green, and violet-colored lights. Artificial illumination is used so as to more closely simulate the actual working conditions, and the various colored glasses are interposed in front of it, a piece of frosted glass also being introduced among the colored ones for the purpose of confusion.

A disc in which these glasses are mounted, revolves, in front of an aperture, on the ordinary shield screening the ophthalmoscopic lamp, or on an asbestos or other chimney specially used for the purpose; there are five round apertures, of about 10-15 mm. diameter each, at regular intervals near the margin of the disc; one of these is unoccupied, and the other four are each filled by a piece of red, green, violet (or purple) and plain frosted glass. The degree of illumination coming through the aperture, can be modified by the use of an iris-diaphragm, or by the intervention of another separate disc, revolving on the same axis as the previous one, and with a series of holes pierced in it, ranging from 1-6 mm. or larger, in diameter. Another piece of frosted glass mounted on a separate small arm, and placed so as to work on the same axis as these two discs, can be combined with any of the other glasses in order to still further modify or diminish the intensity of the rays of light which pass through. There is no need to change the distance at which the test-lamp is placed during the examination, to obtain the alteration which would occur in the light if it were seen under actual working conditions at a far distance, as the color-test offers variations which are sufficient for this purpose.

When the foregoing means are not available, a simple and almost equally practical, and similarly accurate, method for arriving at a proper conclusion as to the power of color discrimination is to employ a series of rounded pieces of paper, 35-40 mm. in diameter, of the same colors as the lights—pale yellow, red, green, and violet; these are placed on a dark background which has a dull surface. These are mounted on a board, at each end of which there are eyelets, so that it can be suspended from either end, or, by using both eyelets, it may be placed with either of its sides uppermost. This yields endless variation and change in the relative positions to each other of the colors; consequently their sequence cannot become committed to memory or learned by rote through frequent repetition, thus maintaining a sufficient and proper standard of unfamiliarity in the test. This possibility of completely and instantly transforming the appearance of the chart, also allows of the colors being indicated by name in the first instance, if deemed necessary, to the individual

under examination, as it does not at all detract from its intrinsic value; this, too, may be done when using the color-test lamp. It is by no means an unknown fact that candidates have failed to pass in an examination, simply and entirely from insufficient knowledge, or even complete ignorance of the *names* of the different colors, although at the same time being fully competent to otherwise distinguish, and unerringly recognize them."

The Necessity for the Use of Color Names in a Test for Color Blindness.

EDRIDGE-GREEN, F. W., London. (*The Lancet*, Nov. 29, 1902—Report of November meeting of Ophth. Soc. United Kingdom.) The reader of this paper said that the first requirements of a test for color-blindness were that color names should be used and the person to be examined should employ and understand the use of the color names—red, yellow, green and blue. No test which ignored color names should be efficient. He predicted that if color names were ignored in the Board of Trade tests, normal-sighted persons would be rejected, and this prediction was fulfilled. Over 38 per cent. one year, and more than 42 per cent. another year, were found to be normal-sighted, and to have been wrongly rejected. An engine-driver or sailor had to name a colored light when he saw it, not to match it. He had to say to himself, "This is a red light, therefore there is danger," and this was practically the same as if he had made the observation out loud. Even the method of matching color should, in order to be efficient, be one of mentally naming them. In his own classification test, he used colored materials of different kinds, as similarity, other than defined by the word "color," was the same source of error in a test of this kind. The color-blind might be divided into two distinct classes, which were independent of each other but which might be associated. The first class included those who were not able to see certain rays of the spectrum; their spectrum was shortened at one or both ends. If a man had shortening of the red end of the spectrum he would not be able to see a red light at a distance, though he might be able to pick out all the green wools in the classification test. A man of this kind when shown the red light of Dr. Edridge-Green's lantern test declared

there was no light visible, at once demonstrating his incapacity. The second class of the color-blind included those who made mistakes not because they could not perceive a certain color but because they were not able to recognize the difference between the colors which was evident to normal-sighted persons. Both these classes were represented by analagous conditions in the perception of sounds. The first class of the color-blind was represented by those who were unable to hear very high or very low notes—that was to say, those notes were non-existent to them. The second class was represented by those who possessed what was commonly called a defective musical ear. Normal-sighted persons saw six definite colors (points of difference) in the spectrum. The second class of color-blind persons saw five, four, three, two colors, or only one color, according to the degree of the defect; and they confused the colors apparent to the normal-sighted which were included in one of their own. If the normal-sighted be designated “hexachromic,” those who saw five colors might be called “pentachromic,” those who saw four colors “tetrachromic,” those who saw three colors “trichromic,” those who saw two colors “dichromic,” and the totally color blind “monochromic.” The degree of the defect would be recognized by the name given to different colors, The pentachromic would miscall orange. The tetrachromic might in addition make mistakes with regard to blue. It was not necessary to reject either of these two varieties, because he had never succeeded in making them confuse the colors red, yellow, green and violet. The trichromic were always in difficulty over yellow and miscalled it red, green, or red-green, and for practical purposes must be excluded as color-blind. The dichromic confused red, orange, yellow, and yellow-green on the one hand, and blue-green, blue, and violet on the other.

Associated Movements of Head and Eyes.

POSEY, WM. CAMPBELL, Philadelphia. (*Journal Amer. Med. Asscn.*, Nov. 29, 1902.) “Under the class of physiologic movements are included the many and varied movements which the head makes through the medium of the neck muscles in supplementing and augmenting the action of the extraocular muscles. Such movements are

often involuntary and are almost constant; and though their mechanism is complicated and intricate by reason of the close association in the cerebral innervation of both extra-ocular and cervical muscles, both sets are enabled to act in perfect unison." "Movements which are abnormal and though simultaneous and having the same pathologic origin are not related in the sense of being dependent on one another, constitute the second class. Under this is included the accidentally simultaneous occurrence of nystagmus and head tremor in certain diseases of the cerebrospinal system, as, for example, in disseminated sclerosis and in paralysis agitans." "The third class is a vicarious position of the head, assumed to compensate for some imperfect action of one or more of the extra-ocular muscles. On account of the close physiologic association between the extra-ocular, the cervical and some of the trunk muscles, in the event of the failure of one of the eye muscles to properly perform its function, this latter may be assumed by some of the muscles of the other groups, but always at the expense of the proper head posture, for a deviation in one set of muscles can only be compensated for by a secondary deviation elsewhere." The writer includes in this group the "wry neck" which has been observed in a few cases after palsy of one of the muscles controlling the vertical movements of the eye; six cases of which are reported.

"The last class includes movements of the head and eyes which are abnormal and bear a direct relationship to one another without being compensatory. Cases of this class are those in which the anomalous movements of both head and eyes are probably the result of a central lesion. The most familiar instance of this class is the simultaneous movements in head and eyes which occur in conjugate deviations after the involvement of certain portions of the brain, as, for example, cases of brain abscess, and not infrequently during the attacks in paretic dementia.

Another type of this class are the cases of head jerking associated with nystagmus which occur in young children—cases of so-called spasmus nictans."

Two cases are reported, one falling under the third class and one under the last class.

The Physiology of the Ocular Muscles.

ELLETT, E. C., Memphis. (*Journal Amer. Med. Assn.*, Oct. 18, 1902.) The action of the muscles on normal eyes alone is considered, and all muscles are studied as moving the normal eye from the primary position. By the motion of the eyeball motion of its visual axis is understood.

"The principal planes of reference are two in number: 1, the fixed median vertical plane of the head passing equally distant from the center of the eyeballs, and 2, a fixed horizontal plane, passing theoretically through the center of rotation of each eye. These planes are, of course, perpendicular to each other and are planes of reference. By comparing the images of any object with these two planes we are enabled to appreciate whether its position is vertical, horizontal or oblique. The planes of motion are two in number: 1, the anterior-posterior vertical plane of the eyeball; 2, the anterior-posterior horizontal plane of the eyeball, coinciding, theoretically, with the fixed horizontal plane of reference. For the sake of completeness we add a third plane, in which lateral motion of the vertical axis would occur if it occurred at all, but we will see presently that it does not occur hence: 3, the equatorial, or transverse vertical plane of the eyeball. All of these planes of rotation pass through the center of rotation and at this point a line passing through the plane and perpendicular to it represents the axis of the rotation of which the plane to which it is perpendicular is the plane of rotation. Thus the axis of rotation for movements of the visual axis in the horizontal plane is a line perpendicular to the horizontal plane at the center of rotation. Besides this axis around which lateral rotation occurs, we have the transverse axis around which vertical rotation occurs and the antero-posterior axis around which there is supposed to occur in certain abnormal conditions a rolling or wheel-like motion of the eyeball called torsion. Of these movements, two are under the control of the will, namely, lateral rotation and vertical rotation. Torsion is not produced under normal conditions, either voluntarily or involuntarily."

"All motions of which the eyeball is capable can be resolved into either rotation in the horizontal plane of rotation about the vertical axis or rotation in the horizontal

plane of rotation about the vertical antero-posterior plane of rotation about the horizontal transverse axis or a combination of the two. No position of the eye can be conceived which can not be arrived at by rotation about one or the other of these axes, or about first one and then the other. The production of motion in a normal eye is denied to the oblique muscles. Neither voluntarily nor involuntarily is a normal eye ever rotated about its antero-posterior axis by the action of these muscles. The only such motion that we can demonstrate is that of so-called "false torsion" seen with the after-images of a bright line, and when this occurs it is due to the actions of the vertical recti. The function of the oblique muscles is to prevent motion, not to cause it.

The writer suggests the following terminology of movements, owing to the state of confusion that now exist.

Movements of the visual axis:

A. Of a single eye (ductions).

- a.* Movements of the V. A. outward = abduction.
- b.* Movements of the V. A. inward = adduction.
- c.* Movements of the V. A. upward = superduction.
- d.* Movements of the V. A. downward = subduction.

B. Of both eyes.

1 Associated conjunctive movements (version).

- a.* Movements of both V. A. to right = dextroversion.
- b.* Movements of both V. A. to left = levoversion.
- c.* Movements of both V. A. upward = superversion.
- d.* Movements of both V. A. downward = subversion.

2 Associated disjunctive movements (vergences).

- a.* Inclining the V. A. toward each other = convergence.
- b.* Inclining the V. A. away from each other = divergence.
- c.* Inclining one V. A. high than the other = supervergence (right and left).

SPECIAL TERMS TO DENOTE THE EXTENT OF ASSOCIATED DISJUNCTIVE MOVEMENTS AS MEASURED BY PRISMS.

- a.* Ability to overcome prisms base outward = prism-convergence.

- b. Ability to overcome prisms base inward = prisms-divergence.
- c. Ability to overcome prisms base downward or upward = prism supervergence (right and left.)

MOVEMENTS OF THE VERTICAL AXIS (TORSION).

- a. Movements of the vertical axis outward = extorsion.
 - b. Movements of the vertical axis inward = intorsion.
- The action of each muscle is given in the following table:

MUSCLE.	PRINCIPAL ACTIONS.	SUBSIDIARY ACTIONS (Not manifested under normal conditions.)
Int. rect.	Adduction	
Ext. rect.	Abduction	
Sup. rect.	Superduction	Abduction and intorsion. Purely a superductor for eyes abducted 27 degrees.
Inf. rect.	Subduction	Adduction and extorsion. Purely a subductor for an eyeball abducted 27 degrees.
Sup. obl.	Intorsion	Abduction and subduction. Purely a subductor for an eyeball abducted 39 degrees. Purely an intor for an eye abducted 51 degrees.
Inf. obl.	Extorsion	Abduction and superduction. Purely a superductor for an eye abducted 39 degrees. Purely an extor for an eye abducted 51 degrees.

False torsion or rotation about the antero-posterior axis is considered as not existing in the normal eye it being prevented by the action of the appropriate oblique muscles.

“The movements of the visual axis of a single eye may be tabulated as follows:

1. Rotation around the vertical axis.

(a) Abduction, external rectus assisted first by superior and inferior oblique and later by superior and inferior recti.

(b) Adduction, internal rectus assisted by superior and inferior recti.

2. Rotation around transverse horizontal axis.

(a) Superduction, superior rectus assisted by inferior oblique, which also counteracts the torsion, and by internal and external recti later. The latter counteracts adduction.

(b) Subduction, inferior rectus assisted by superior oblique which counteracts extorsion. Internal and external latter. The latter counteracts adduction.

Oblique movements are simply compound of the above. For instance in looking upward and outward we may consider this as a movement, first upward and then outward."

"The law governing the motion of the eyes is stated as follows by Savage: "The recti muscles must control the visual axes, the superior and inferior recti, keeping them always in the same plane, the internal and external recti making them intersect at the point of fixation. The obliques must keep the vertical axes parallel with each other and with the median vertical plane of the head.'"

The Anatomy of the Ocular Muscles and Their Accessory Structures and the Phorias and Tropias.

COLBURN, J. ELLIOTT, Chicago. (*Journal Amer. Med. Assn.*, October 18, 1902.) The writer's observations were based upon the study of two hundred cases examined for errors of refraction. The size and mobility of the eyes seem to vary with the size, shape and position of the orbital cavity and its relation to the plane of the face; there is a direct relation between the angles of the base of the orbits and the facial plane. Three types are considered, the emmetropic, hyperopic and myopic. The orbital apices were nearer together in the myopic type. The facial plane was determined by a line drawn through the attachments of the tendo-oculi and orbicularis palpebrarum; plane of the base by drawing lines from these points to outer angles of orbits. He considered the anatomic differences in the development of special types. Hyperphoria occurs most frequently in unsymmetrical orbital planes, the direction of the error following the most marked displacement; hence "the futility of operating for the correction of tropias or phorias in certain extreme types can be readily understood when viewed from the standpoint of the bony structure as entering into the cause of the anomaly, and I believe that many of our relapsing cases, which have been classified, for want of a better term, as neuro-muscular, will find their place in this group. All who have atypic bony structures do not manifest, either in pose or by asthenopia, the symptoms of their type. The soft tissues and muscles are trained to overcome the imbalance to which the static structures would predispose them. It seems from my observations to be also true that the dynamic or static soft

tissues may also be alone at fault and be the cause of any of the anomalies of the lines of regard. The check ligament, by being developed, may hamper the opposing abducting or adducting muscle. In complete tenotomy the check ligament may draw the muscle away from and prevent its attachment to the globe. The opposing muscle may be hampered by shortening of its orbito-muscular check ligament, due to habitual malposition of the eye from overaction of one of the recti muscles, from squint, or from malposition of some of the static structures. The orbito-ocular check ligament may become so elongated and attenuated by continual malposition as to destroy its function as a check. Adventitious bands may exist as the result of imperfect development of the orbital fascias, either through excessive stimulation, as the result of trauma or inflammation of the orbital fascias, which may modify the actions of the muscles, and limit the rotation of the globe. A complete unguarded tenotomy may allow so much retraction of the muscle that the range of action of the musculo-orbital check may be such as to limit the power of the muscle which is directed against it, instead of the globe, thereby limiting the field of rotation and fixation."

A Method of Excision of the Eyeball to Secure Greater Mobility of the Stump.

CLARKE, ERNEST, London. (*British Med. Journal*, November 1, 1902.) The writer insures increased mobility of the stump by fixing the two lateral muscles; he does not consider the suturing of the superior and inferior recti desirable since this might tend to fix the central area of the stump and somewhat interfere with lateral movement besides he believes the vertical movement of the artificial eye to be immaterial. This method of operating is as follows:

"After the conjunctiva is opened, the external rectus is hooked up and all lateral attachments divided; a Prince's forceps is then clamped on the muscle as close to the globe as possible and the muscle divided between the clamp and the globe. The same is done with the internal rectus. The other muscles are divided and the eyeball removed in the ordinary way. With the removal of the eyeball the circular opening of the conjunctiva becomes

more or less oblong. A catgut suture is now passed into the external rectus close to the clamp, it removed, and the muscle secured to the lower margin of the conjunctival opening, a little beyond the middle line. The same is done with the internal rectus to the upper margin. Finally, two fairly thick silk sutures are passed through the upper and lower margins of the conjunctival opening; these stitches are left long and tied about 3 inches from the wound. They serve to keep the margins of the conjunctiva in apposition and yet allow of any egress of fluid—blood, etc.—that may accumulate in the wound. They are removed entirely about the fourth day.”

On a Method of Suturing the Tendons to Form a Better Stump After Enucleation of the Eyeball.

SNELL, SIMEON, Sheffield. (*British Med. Journal*, November 1, 1902.) Union of the conjunctiva alone, as usually practised with the “purse-string” suture after enucleation, is not sufficient to allow good movement of the stump. Care exercised in removing the eyeball with as little disturbance of the orbital tissue as possible and in dividing the tendons close to the ball will tend to produce a good stump. But if in addition to these precautions, the tendons are united to each other a better and more freely movable stump will be produced than when the muscles are allowed to shrink back. The method of accomplishing this has been used by Snell in sixty cases during the past three years, is satisfactory, and is more simple than other procedures advocated for this purpose:

“The conjunctiva is divided close to the corneal margin, as in the usual method of enucleation. A squint hook is then passed underneath one of the tendons, and a needle armed with silk is run through the tendon across its width, and the silk tied not too tightly. The free end of the suture is cut short. The needle is then passed through the conjunctiva near to its cut edge and for the present left there. The tendon is next severed close to its sclerotic attachment. Each tendon is treated in the same manner, and the globe is removed in the ordinary way with as little disturbance of the tissues as possible. Care is necessary in removing the eyeball not to sever the sutures which are fixing the tendons to the conjunctiva. It is a convenience, to attach a pair of pressure forceps to

each needle or end of silk if the needle has been removed. The next step consists in tying not too tightly the inner and outer sutures and then the upper and lower, thus bringing into apposition respectively the inner and outer and upper and lower recti. The sutures are then cut close. The resulting wound is a horizontal one, and usually an additional suture in the conjunctiva at each extremity of the wound will be necessary. Catgut and silk-worm gut have been employed for the sutures; at present I am using silk which has been sterilized. It is convenient to use a similar colored suture for the outer and inner recti and one of another color for the upper and lower, a device which facilitates the sorting of the sutures preparatory to the final tying."

The advantages of this suturing are more rapid healing, prompt arrest of bleeding, a more movable stump, a better stump for an artificial eye, and a less pronounced upper lid sulcus.

Principles Controlling Operative Interference in Heterophoria.

GARDINER, E. J., Chicago. (*Journal Amer. Med. Assn.*, October 25, 1902.) Careful inquiry into the patient's antecedents, history and habits with especial attention paid to any neurotic or hysterical tendency, the manner in which the eyes are used as to time, light, position of book and work; thorough exclusion of refractive errors, under atropin up to 35 years of age and homatropin from 35 to 45 years. In ametropia or anisometropia full correction should be ordered and used for at least three or four weeks during which time the balance and muscular power should be repeatedly tested. If the correction of refractive errors does not bring about relief of the muscular anomalies, proper prism exercises and electric treatment are resorted to; if this is not effectual, operative measures must be resorted to, i. e., the graduated tenotomy of Stevens. The paper is tersely summarized:

"Study your patient thoroughly. Eliminate all extraneous causes. Correct ametropia and anisometropia. It may be all that is required. If not, strengthen the weaker muscle. Give these methods a fair trial. If in doubt, *do not operate*. If you decide to operate, use your scissors with care and with brains."

The Principles Controlling the Non-Operative Interference in Heterophoria.

AYRES, S. C., Cincinnati, Ohio (*Journal Amer. Med. Assn.*, Oct. 25, 1902), says "Heterophoria covers everything we are fighting to smooth down, abate and correct by general and local treatment, and by mechanical appliances and operative measures."

Ametropia corrected, the consideration of constitutional and physical conditions and their alleviation, the helping of the weaker muscle either by prism exercise or prisms, the temporary changing of existing environment, on taking poorly developed and nourished children or girls just developing the menstrual function from their school and giving them a chance to recuperate.

Operative measures should not be resorted to until all other measures have been exhausted.

Principles Controlling Operative Interference in Strabismus.

JACKSON, EDWARD, Denver. (*Journal Amer. Med. Assn.*, Nov. 1, 1902.) "With normal acuteness of vision the deviation of the visual axis one-fiftieth of one degree from the fixation point will produce intolerable confusion and blurring. A deviation of one-fiftieth of one degree means an error in the relative lengths of opposing muscles of $1/240$ of one millimeter, $1/6000$ of an inch, one-half of the diameter of a red blood corpuscle. Simply from the standpoint of mechanical exactness what are the chances of making a perfect adjustment of the ocular muscles by operation.

Operations do not cure strabismus, but they can lessen its amount so that it may pass unnoticed or may be overcome by other measures. At its best, operation may be a necessary step toward cure. More frequently it is but a means of diminishing and rendering less noticeable an incurable deformity."

Neuro muscular and connective tissue determine the direction of the eye in the orbit; the eye is likened to a ball supported in a hammock of connective tissue in which it is swung and turned by the contractions of the ocular muscles.

"These connective tissues prevent the globe from being drawn back into the orbit, and may at any given time exert an influence that will determine the direction of the

visual axis, when not overcome by preponderating muscular influence. But when one or more of the muscles are actively contracted the influence of the connective tissues, other than the muscular insertions, becomes comparatively insignificant, except in limiting the most extreme rotations. The problem of strabismus is practically a problem in neuro-muscular dynamics.

In attempting to solve it we must remember that the length and strength of a muscle depend on the nerve impulses passing to it. A muscle exists simply that its length may vary. That is its whole function. Equally characteristic is its capacity for hypertrophy under the influence of appropriate nerve impulses, and for atrophy when these are cut off. In view of these facts the first question to be asked regarding operative interference is: How will it influence the innervation of the muscles which act upon the eyeball, or will it leave that innervation quite unaltered.

According to the answer to this question strabismus cases are to be divided into two classes. Those in which operation is likely to modify the innervation, as in concomitant squint, where it will render possible binocular fixation which may be operated upon early, but, rather tentatively, with great care to avoid any excessive effect, or any unnecessary disturbance of parts. The other class includes those in which there is no probability that operation will change the innervation of the muscles, as in paralytic strabismus; or in concomitant strabismus in adults, without any possibility of producing binocular diplopia and without reflex binocular co-ordination of any sort. In these cases operation should be deferred until the extent of deviation has become quite fixed and incapable of further favorable modification by non-operative measures."

The changes that muscles may undergo after advancement or tenotomy, i. e., atrophy, hypertrophy or adhesion of the muscle to the sclera at a different point than its original insertion, may alter the influence expected to be obtained at the time of operation. Lateral displacement may be a means of modifying the influence of the muscle on the globe.

In every operation the action of the secondary rotators

must be considered as well as that of the primary which the operation is designed to effect.

The Non-Operative Treatment of Strabismus.

GOULD, GEO. M., Philadelphia (*Journal Amer. Med. Assn.*, Nov. 1, 1902), says: "In my private practice I have in six years seen no case that I believe needed operation, and I have seen none benefited thereby, at least none that could not have been benefited by other methods of treatment."

"All strabismus is preceded by heterophoria," and "all chronic or permanent strabismus is preceded by a stage of acute, functional or incomplete strabismus." This G. gives as the epitome and essence of his experience and of all he has to say on the subject. With few exceptions, in the cases under discussion, the muscles and tendons are not abnormal. "The incoördination of innervation which causes all heterophoria and strabismus is a functional disease, and is caused by the fact that the peripheral organs are so optically dissimilar and defective that binocular vision is impossible. Anisometropia and astigmatism are the initial sources of the impossibility of binocular vision, in the vast majority of cases."

G. excepts traumatic, paralytic, most cases of alternating strabismus and some anomalous cases.

"The non-operative treatment of strabismus naturally divides itself into:

1. Prophylaxis.
2. The treatment of ametropia.
3. The treatment of heterophoria.
4. The treatment of amblyopia.
5. The treatment of physiologically curable strabismus.
6. The treatment of alternating strabismus.
7. The treatment of anomalous cases.
8. The treatment of incurable cases."

Under prophylaxis, education of the public as to dangers of strabismus and commencement of treatment when heterophoria, temporary or acute strabismus is diagnosed.

The treatment of ametropia consists primarily in getting proper glasses on the child as early as possible. "As to emmetropia in heterophoria and strabismus, I have never seen a case, and do not believe such a case ever existed."

Heterophoria is treated by thorough-going prism gymnastics.

Systematic monocular gymnastics in amblyopia with perfectly fitting correcting glass over the affected eye will bring about remarkable success when intelligently carried out with persistence and patience, the better eye being continually occluded, or part of the time, or, if the amblyopia is of not too great degree, a mydriatic applied to the better eye will allow the poorer one to compete with it in vision.

In physiologically curable strabismus Gould advises several years, a dozen or a score perhaps, of treatment by means of correction of the ametropia; reinstating normal co-ordinating innervation of the muscles and treatment of amblyopia.

Alternating strabismus when taken early enough in life may be cured by the methods described, "but there are varieties of the affection which it is not desirable to cure, especially if the habit is 'chronic' and operation would have no good effect.

Anomalous cases "will of course depend upon the unclassifiable conditions present plus the intelligence, the conscience of the physician." Incurable cases come under: 1. The paralytic. 2. Chronic cases due to parents' neglect or the ophthalmic surgeon. 3. The worst and most incurable cases of strabismus are those which are the result of unsuccessful operation for heterophoria or strabismus. In the first and second cases the advice is to leave the eye untouched and in the latter give what relief can be obtained by correction of refraction and gymnastic training.

The Decentering of Lenses for Near Work.

SAVAGE, G. C., Nashville. (*Journl Amer. Med. Assn.*, November 22, 1902.) "The ideal position of lenses, when there is perfect muscle adjustment of the eyes, is such that the visual axes may cut their optical centers, and that the planes of the lenses may be parallel with the equatorial planes of the eyes. When the visual axes cut the optical centers of the lenses there can be no prismatic effect; and when the plane of the lens is parallel with the equatorial plane of the eye there can be no cylindrical effect.

1. If there is orthophoria, presbyopic lenses should be properly centered, that is, they should be so placed that each visual axis will cut the optical center of its lens, when a point of fixation is in the extended median plane of the head.

2. If there is uncomplicated esophoria, both presbyopic lenses should be decentered directly out, and to an equal extent, so that the two visual axes may cut the lenses to the nasal side of their optical centers, thus favoring the weak externi. This can be accomplished equally as well by making the frames wider than called for by the pupillary measurement.

3. In esophoria complicated only by hyperphoria of one eye and cataphoria of the other, the decentering of presbyopic lenses should be confined to the lens for the hyperphoric eye, and should be down and out, so as to develop a compensating eso-hypertropia of this eye.

4. In esophoria, complicated by hyperphoria of one eye and cataphoria of the other, with plus cyclophoria, the decentering of presbyopic lenses should be confined strictly to the lens for the hyperphoric eye, and should be down-and-out, so as to develop a compensating eso-hypertropia.

5. In simple exophoria each presbyopic lens should be decentered directly in and to an equal extent, or what would be the same in effect, the frames should be made narrower than would be indicated by the pupillary measurement.

6. In exophoria complicated by hyperphoria of one eye and cataphoria of the other, the decentering of presbyopic lenses should be confined to the one for the cataphoric eye, and should be in-and-up.

7. In exophoria complicated by hyperphoria of one eye and cataphoria of the other, with plus cyclophoria, the decentering of the presbyopic lenses should be confined strictly to the one for the cataphoric eye, and should be in-and-up.

8. In hyperphoria of one eye and cataphoria of the other, with or without plus cyclophoria, the decentering of presbyopic lenses should be confined to the one for the hyperphoric eye, and should be directly down.

9. In double hyperphoria uncomplicated, both pres-

byopic lenses should be decentered directly down, and to an equal extent; or, what would be the same in effect, the rose-bridge should be made deep enough to allow the visual axes to cut the lenses above their optical centers.

10. In double cataphoria uncomplicated, if any decentring should be done at all it should be directly up.

11. If there is plus cyclophoria only, in a presbyopic case, both correcting lenses should be decentered down. The maximum vertical prismatic effect should be placed at one degree, certainly not more than two degrees, and the maximum lateral prismatic effect should be placed at two degrees, certainly not more than four degrees. In the greater number of cases the prismatic effect should correct about one-half the manifest error, but in some cases a full correction, especially of a small vertical error, may be given.

Prisms and decentered lenses interfere with some of the visual judgments and therefore are objectionable. For this reason it is better to cure muscle errors of low degree by proper prismatic exercise. Muscle errors of high degree should be treated surgically."

Vasomotor Disturbance of the Eye.

LODGE, SAMUEL, Halifax. (*Brit. Med. Jour.*, Nov. 1, 1902.) During the last three years, the writer examined the eyes of thirty patients in whom there were undoubted signs of vasomotor disturbance in other parts of the body; six of these presented symptoms of the definite Reynaud type: (1) Spasmodic contraction of the central artery of the retina and its branches; (2) marked dilatation of the retinal veins with, in some cases, palpation; visual fields greatly contracted in temporal and infero-temporal portions, but fairly or quite full on nasal side,

"As a result of the above operations, whenever ophthalmoscopic examination of any patient has disclosed contraction of arteries and dilatation of veins I have made inquiries for symptoms in other parts of the body. To my surprise I found the above retinal appearances and changes in the visual fields to be quite as characteristic in certain cases in which vasomotor disorders elsewhere were only slight, and not considered important enough for medical treatment by the patients, as they were characteristic in the severe cases of the definite Reynaud type.

Such patients generally complain of intense frontal and parietal headache; their eyes ache on using them for any length of time, and very often there is more or less ametropia for which they are already wearing the proper correcting lenses. Formerly I looked upon these cases as those of reflex asthenopia, but they certainly cannot be placed under this category. The patients are generally of a neurotic type, and have an anxious expression of countenance; sometimes proptosis of one or both eyes is observed, and occasionally edema of the eyelids. Dilated episcleral veins, contraction of the pupils, and sometimes ciliary spasm, are noticed. The thyroid gland is occasionally enlarged, but beyond the prominent eyeballs there are no signs of exophthalmic goitre.

The diagnosis of vasomotor disturbance of the eye is easy and unmistakable if an attack of subconjunctivitis come on and go off whilst the patient is under the surgeon's observation. In the chronic form the diagnosis, unless corroborative symptoms be considered, is most difficult. Here one may state that the consideration of some cases led me to the conclusion that the condition described in the text-books as the "hot eye" of Hutchinson, or subconjunctivitis of Graefe, or periodic transient episcleritis of Fuchs, is really a vasomotor affection of the eye."

The writer used suprarenal liquid locally with striking effect; internally he prescribed suprarenal gland substance for the milder forms of associated vasomotor disturbances.

On the History of the Theory of Sympathetic Ophthalmia.

GIFFORD, H. Omaha. (*Archiv. Ophth.*, November, 1902.) The recent investigations of Selenkowsky and Bellarminoff having called forth a protest from Rosenmeyer as to the priority of the idea that sympathetic ophthalmia might be produced by toxins carried over from the first infected eye; attention is called to the fact that Alt (*Amer. Journal Ophth.*, I, 4, p. 98) gave the first experimental proof that a soluble organic poison (an infusion of Jequirity bean) could travel by way of the optic nerves and their sheaths to the other eye and there produce the initial symptoms of sympathetic ophthalmia. To Alt also belongs the credit of the first pathologic evi-

dence in favor of the transmission through the optic nerves instead of the ciliary nerves; as changes were found in only $16\frac{2}{3}$ per cent. of the eyes examined while the optic nerve and the retina showed such changes in 79 per cent., hence his recommendation in enucleating for sympathetic ophthalmia, to include as much of the optic nerve as possible; at this time the germ theory of inflammation was not yet far enough developed to permit the inference at present so obvious, that the inflammation must be caused by germs or toxins. However, with the generalization of this knowledge, the inference was made almost simultaneously in 1881, by Snellen, Leber and Berlin that the germs reached the second eye through the blood vessels and developed there rather than in other parts of the body on account of the presence there of a more favorable medium for their growth and although the views of the three were practically the same the fact that the argument of Leber was more elaborate and was quickly followed by the experimental work of Deutschmann has caused the germ theory of sympathetic ophthalmia to be widely known as the theory of Leber & Deutschmann.

Schmidt-Rimpler's attempt to combine Berlin's theory with the germ and ciliary nerve theory assumes that the germs after reaching the second eye by the blood vessels, develop there on account of the uveal tract affording a particularly favorable medium for their growth because of the congestion produced there by vaso-motor reflex from the injured eye. The idea that sympathetic irritation favored the development of sympathetic ophthalmia although it was a germ disease was advanced by the writer long before Schmidt-Rimpler. However, if the ciliary nerve theory is to be combined with the theory of transmission by the blood current, it lacks some factor which will account for the non-occurrence of the disease in the numberless cases of reflex irritation from external diseases of one eye through long periods during which occasional germs capable of producing inflammation must have entered the blood from the alimentary or respiratory tracts.

"If we assume, as did Berlin, the existence of a germ especially adapted for growing in the tissues of the eye,

it is not necessary to call upon the influence of vasomotor irritation to explain sympathetic ophthalmia (although such influence may be admitted as a favoring factor) and this hypothesis of specificity cannot now be rejected so summarily as was done by Leber years ago, on the ground that bacteriology gave no support to the hypothesis of a germ whose action is limited to a particular organ. The eye offers a striking parallel in the case of trachoma. Clinical and pathological evidence makes it practically certain that trachoma is caused by the growth of some germ which gives no evidence of a tendency to invade any other tissues than the conjunctiva and possibly the lining of the lacrimal sac; and which, as with the cause of sympathetic ophthalmia, has hitherto eluded all efforts to discover it. In the case of sympathetic ophthalmia, however, it is necessary to assume the existence of a germ specially adapted by nature for growth in the tissues of the eye before its entrance into the latter. The rarity of the disease, and the fact that it practically never has a chance to be propagated from case to case, both speak against such an assumption; but it may be that various species of microbes after growing within the eye for several days or weeks, may, by a process of natural selection, acquire a certain specific adaptation to the uveal tract, so that, on being carried to the second eye by the blood current, they find there conditions most favorable to their development."

Etiology and Treatment of Glaucoma.

SCHOEN, W., Leipzig (*Ophth. Record*, October, 1902), says "Dr. Javal's case has shown that the treatment by iridectomy or sympathectomy is based upon a wrong conception of the conditions. Both methods when applied to his case failed to give relief."

"The common theory of glaucoma starts with the supposition of high tension in the affected eye. All the thought has been given to the cause and the relief of this by the adherents of the tension theory on the ground that the examinations were made during the intervals of increased tension. According to these data a definition of glaucoma simplex would read: Glaucoma simplex is a form of glaucoma in which the tension occurs always during the absence of the surgeon! If the patient could but live in

the presence of his surgeon he would never suffer from an attack! The theory was supposed to account for the cupping of the optic nerve. But as a matter of observation the deepest cuppings are frequently found in cases which show absolutely no increase of tension, and *vice versa*. In the human body there are three mechanical forces which cause increase of tension, namely, inflammation, tumor and heart action. The first two may be dismissed at once, as glaucomatous eyes do not show any evidence of either. The interior of the eye is always exposed to blood pressure, but this theory has never accounted satisfactorily for the increase in tension. The real cause of the increased tension is the loss of support of the ciliary muscle and its tendons, thereby permitting the intra-ocular pressure to be exerted directly upon the sclera and the tension then becomes perceptible to the touch."

"The origin of iridectomy as a remedy for glaucoma is not clear. Evidence is lacking that the iris has anything to do with the tension of the eye, and if iridectomy is expected to relieve the glaucoma by lessening the tension, what effect would it have in glaucoma without increased tension? Microscopical research has indeed shown that the anatomic changes have been made worse by iridectomy.

"Besides the beginning of the excavation, I discovered anatomical changes in the ora serrata with degeneration of the ciliary muscle. (Schoen l. c.). The degeneration of the ciliary muscle I consider to be the missing link explaining glaucoma simplex. The result of these researches is not an agreeable one. There is absolutely no hope of curing a well-established case of glaucoma by operation or by any other means, although we may delay its progress when seen early.

It is quite easy to recognize the premonitory signs, not only of glaucoma simplex, but also of the other forms of glaucoma. Increase of tension must be relegated to the rank and file of glaucoma symptoms. In 1884 I stated that 80 per cent. of glaucomatous eyes were either hypermetropic or astigmatic; 13 per cent. afflicted with insufficiency of the recti-interni and the remainder presbyopic, and I quoted many cases where the progress of glaucoma

was checked by correcting these errors. Since then a number of cases have been reported by others showing cures made by the same means. Now, looking back over the histories of 300 cases of glaucoma afore mentioned, I repeat with conviction, that every eye can be guarded against glaucoma if it can be seen early enough by an ophthalmologist who is accustomed to observe the preliminary symptoms. When fully developed it is absolutely impossible to cure the disease by any known means or any method yet invented."

(These views while very radical are certainly worthy of consideration owing to the lack of the exact knowledge of the affection and the prominence of the author. Ed.)

The New Surgical Treatment of Glaucoma.

LAMOTTE, H., Salt Lake City (*Ophth. Record*, October, 1902), defines glaucoma as a disease of many varieties, "but the essential conditions of all forms is that of increased intra-ocular tension." As to its etiology he is inclined toward the theory that the seat of the primary trouble is in the nervous structures supplying motor and trophic fibers to the iris and ciliary body.

Under treatment, the use of miotics and iridectomy are discussed, the author believing iridectomy is *imperatively indicated* in glaucoma of long standing which has caused an adhesion of the posterior surface of the cornea and the anterior surface of the iris.

Two cases are reported on which sympathectomy were performed with good results and the author believes that with the percentage of good results reported it does not need the endorsement of even the best known men in ophthalmology.

Pathology of Uveitis.

WILDER, WM. H., Chicago (*Journal Amer. Med. Assn.*, October 4, 1902), defines uveitis as an inflammation of any portion of the uveal tract which embraces iris, ciliary body and chorioid, which if severe, may involve other divisions. He limits his paper to lesions of the chorioid.

A satisfactory classification of the forms of chorioiditis is difficult as their pathological anatomy is not largely

varied, the most convenient and simple being into the purulent or suppurative and plastic chorioiditis.

The extraordinary richness of the blood supply of the chorioid is an important factor in its pathology; the blood current of the chorio-capillaries as compared with the arteries that supply it, is estimated to be enlarged more than 32 times and consequently the current is markedly reduced in velocity and strength, so any passive congestion of the veins or active hyperemia of the arteries produces increased tension in the chorioid and diapedesis into the tissues outside of the vessel, showing why many of the lesions have their beginning in the innermost layer.

In the suppurative form there is first a rapid round cell infiltration of the vascular layers, emboli and thrombi; the retina lifted up by pus cells becomes involved and breaks down, vitreous becomes turbid, tension is raised and the process proceeds anteriorly involving the ciliary body, iris. Exudate appears in anterior chamber, marked congestion of the ciliary veins, edema of conjunctiva and lids, softening and rupture of sclera and the well known picture of panophthalmitis. Trauma, metastasis, infection, emboli and pseudo-glioma are usual causes.

Plastic chorioiditis or disseminated, areolar, central or chorio-retinitis, as it is variously called because of different situations of the lesion, are all very similar pathologically and show at first enlarged capillaries surrounded with leucocytes and amorphous fibrinous exudate pushing up the vitreous membrane, these patches coalesce to form larger ones, the exudate absorbing or undergoing organization, new cicatricial tissue takes its place and the chorioidal tissue atrophies; the pigment layer of the retina proliferates, rods and cones are destroyed and the pigment masses are found in the outer layers of the retina itself and the margins of the atrophic chorioid; there is more or less opacity of the vitreous from exudate and round cells.

Sclero-chorioiditis, in progressive myopia the edges of the conus show a proliferation of pigment heaped up in masses; the capillaries are closed; the layers of the chorioid and even sclera are infiltrated and the epithelial and rod and cone layer of the retina disappear.

The author has observed in both chorio-retinitis and central chorioiditis opacities in the vitreous so faint as to escape hurried examination without mydriasis which preceded the manifest chorioidal lesion in clearly non-specific cases.

The Treatment of Uveitis.

MARPLE, WILBUR B., New York (*Journal Amer. Med. Assn.*, October 4, 1902), sums up the paper very concisely:

"1. That the etiology of the ocular inflammation is to be investigated in order to obtain some general therapeutic indication.

2. That in general in acute processes of specific origin, mercury, best by inunctions, is indicated, aided, if necessary for the absorption of exudates by iodides.

3. That mercurials are often of service even where there is no specific cause demonstrable but that here oftentimes salicylates accomplish more than the iodids.

4. That atropine is pretty generally indicated, aided, if necessary, in severe inflammations by moist heat and diaphoresis.

5. That subconjunctival injections either of sublimate or chloride of sodium may sometimes be tried. They can do no harm, though it is not yet certain how much good they accomplish or just what are their indications."

The Treatment of Certain Non-Specific Lesions of the Uveal Tract with Pilocarpine and Sweat Baths.

WOODRUFF, THOMAS A., Chicago (*Journal Amer. Med. Assn.*, October 4, 1902), states that while many lesions of the chorioid and ciliary body are by their nature irreparable, a large minority are capable of some improvement and that notwithstanding the claims of many of the newer remedies none of them have given as good results in selected cases as the hypodermic use of pilocarpine in conjunction with sweat baths and the internal administration of potassium iodide in increasing doses, with large quantities of water, to toleration.

"As the hypodermics and baths should be given when the stomach is empty, there being less danger from the untoward effects of pilocarpine at that time, they are best administered the first thing in the morning. The patient should be in bed and wrapped up to the neck in a blanket

and again covered with at least four blankets. Under the latter half a dozen quart bottles containing boiling hot water should be placed. The hypodermic injection of pilocarpine hydrochlorate beginning with one-eighth of a grain should now be given, at the same time having the patient drink at least a pint of hot water, weak lemonade or tea. In a few minutes the patient should begin to break out into a profuse perspiration, which should continue for at least two hours, only stopping short of that time if he shows any bad symptoms. At the end of the sweat he should be thoroughly dried and the skin rubbed with alcohol and then allowed to rest the remainder of the day. This treatment should be continued at least every other day until twelve such baths are taken. At an interval of two or three weeks a similar course of treatment should be repeated, and then continued at various intervals as long as any improvement takes place."

Functional or Hysterical Amblyopia.

GUNN, MARCUS R., London. (*Ophthalmic Review*, October, 1902.) Gunn sums up briefly the case of functional amblyopia into two great divisions, viz. (1) idiopathic, usually occurring in women, but sometimes met with in children (about 9 to 14); (2) traumatic, occurring probably equally in both sexes, but always, so far as his experience goes, in adults. Gunn thinks we are still absolutely in the dark as to the nature of the affections of the nervous system underlying hysterical manifestations. Many forms have apparently an element of simulation. In many cases no single central lesion will account for all the symptoms. When such lesions actually exist it is not a pure functional disorder that has to be dealt with but an obscure early manifestation of real organic disease. Many hysterical persons subsequently become affected with an ailment such as insular sclerosis, and this must make us pause before dismissing them as of little or no importance. As a working hypothesis it can be assumed that there is in most, if not all, cases a temporary, partial, or complete loss—whose nature is as yet unknown—of the power of conduction between the lower or middle visual centres and the highest conscious centres. Gunn drew attention to the cases of supposed blindness in very young children that occasionally come under observation. Such a child is taken to the

surgeon with the mother's statement that "it takes no notice of anything." He finds that it pays no attention to moving objects brought near to it, yet ophthalmoscopically there is nothing amiss, and the prognosis is favorable. Gunn thinks that in such infants of delayed visual consciousness there may be some retarded development of higher association-fibres. Gunn has remarked elsewhere, "it would appear as if there were some similarity between these cases and those which, occurring later in life, we call 'hysterical amblyopia.' In both the retina is perfect, the optic nerve is quite able to conduct impressions, the tracts are normal the sight-centres presumably fit for work and actually receiving impressions, and yet there is no consciousness of these impression, or such a diminished consciousness as to occasion no actual response." In the hysterical individual the association-fibres had been normally developed and previously efficient, but from some unknown cause they have ceased to conduct. Suggestion, the power of a strong will acting upon the weaker one, a shock or surprise or voluntarily strong exertion of the patient's own will is sufficient, in an early stage at least, of the affection to re-establish this lost conducting power for a time. It would seem that in hysteria a very susceptible nervous organization has to be dealt with, possibly malnutrition, and it is a well-known clinical fact that this nerve peculiarity may be inherited.

The above indicate the lines of treatment are usually most successful. Removal from home surroundings is of importance when it can be arranged; when it cannot, the friends must be cautioned against the impropriety of drawing attention to, or showing sympathetic regard for, the symptoms. Health surroundings and a judicious nourishing diet are necessary. Further treatment consists in the employment of the time-honored and unquestionably beneficial remedy, assafoetida, given in large doses, and in the use of faradism.

Experimental Lesions of the Retina.

PARSON, J. HERBERT., London. (*Brit. Med. Jour.* Nov. 1, 1902.) Lesions were produced in the retinae of six monkeys with the ultimate object of tracing the degenerations in the optic nerves and tracts. A Graefe cataract knife was introduced into the eye 4 or 5 mm. behind the limbus and

and passed across the eye to the opposite side and the retina wounded there to the required extent. The animals were killed from 2 to 3 weeks after the injury, the eyes hardened in formal, frozen, divided and microscopical examination made.

Valuable information was obtained as to the healing and aseptic wounds, of the ocular walls. The result confirmed the general statements of previous observers that perforating wounds heal through the agency of the episcleral tissue and the chorioid, the sclerotic taking little part in the process.

After being treated by the Busch-Marchi method, the optic nerves and brain showed the following:

"1. The degenerated fibres in the main retain the same position along the whole course of the nerve; that is, the nasal fibres kept the inner side of the nerve, and the temporal to the outer side. There are usually some out-lying fibres degenerated, probably due to the operative disturbance of the vitreous.

2. There are invariably some degenerated fibres in the optic nerve of the opposite side. This result confirms the previous experiments of Pick and of Dean and Usher on the rabbit by the ordinary Marchi method. These fibres tend to occupy the homonymous side of the opposite nerve. They are probably collaterals of the fibres in the nerve of the injured side, and are perhaps distributed to physiologically corresponding parts of the opposite retina.

3. The fibres from the macular region pass from the temporal sides of the nerve anteriorly toward the centre as they pass back.

4. In all cases there is degeneration in both optic tracts. The degeneration in the opposite tract in temporal lesions is slight but definite. As far as the method is capable of showing, it consists of fine fibres probably collateral of the fibres in the nerve of the injured side.

5. The fibres spread out as they pass back in the tracts, and are distributed over the whole area posteriorly. Most go to the external geniculate body, some to the optic thalamus, and a few to the superior corpus quadrigeminum.

6. In many cases there was apparent degeneration amongst the fibres of the roots of the third and fourth nerves. These were probably fatty globules in lymph

channels as in some of Marchi's early experiments, and not true degenerations.

**Two Cases of Retinal Detachment Treated with
Subconjunctival Injection of Salt Solution.**

RANDOLPH, ROBERT, L, Baltimore. (*Journal Amer. Med. Assn.* Oct 11, 1902.) Two cases are reported, one with total detachment of 18 months duration in an eye operated on for cataract; the other a detachment of about one-half in a myopic eye. The injections were started with a syringe of normal salt solution and gradually increased in six weeks to 20 gr. to the ounce given every other day the patient being kept in the bed, the reaction was sometimes intense after the injection of the stronger solution lasting all night after the use of a 20 gr. to the ounce solution. The result was good in both cases, the retina returning to place but detaching again shortly after the patients were up and about. The author is certain that rest in bed played a conspicuous part in the improvement.

"The technic was as follows: The speculum, fixation forceps and hypodermic syringe were boiled five minutes before using. The salt solution was boiled in a test tube three minutes, so also the cocain. A compress bandage was applied immediately after the operation, and kept on all the time. When the reaction was intense a pad moistened with a solution of lead and opium was placed over the lid and the bandage applied as before.

The Disappearance of Opacities of the Crystalline Lens.

PYLE, WALTER L., Philadelphia. (*Journal Amer. Med. Assn.*, Oct. 18, 1902.) Pyle classifies the reported cases as follows:

"1. Cases in which there was absorption after spontaneous rupture of the anterior or posterior capsule.

2. Cases in which there was spontaneous dislocation of the cataractous lens.

3. Cases in which there was intracapsular resorption of the opaque cortex and sinking of the nucleus below the axis of vision, after degenerative changes in Morgagnian cataract, without rupture of the capsule or dislocation of the lens.

4. Cases in which there was complete spontaneous resorption of both nucleus and cortex, without reported his-

tory of ruptured capsule, dislocation or degenerative changes of the Morgagnian type.

5. Cases of spontaneous disappearance of incipient cataract without degenerative changes or marked difference in the refraction."

Reports of cases are cited of traumatic opacities having disappeared; of long delayed or non-progressive cataract; of the absorption of diabetic cataract. The article is summed up as follows:

"1 There is no question as to the authenticity of many reports of the spontaneous disappearance of senile cataract, and these cases may be explained and classified in five groups as follows:

a. Cases in which there was absorption after spontaneous rupture of the anterior or posterior capsule.

b. Cases in which there was spontaneous dislocation of the cataractous lens.

c. Cases in which there was intra-capsular resorption of the opaque cortex and sinking of the nucleus below the axis of vision after degenerative changes in Morgagnian cataract, without rupture of the capsule or dislocations of the lens.

d. Cases in which there was complete spontaneous resorption of both nucleus and cortex without reported history of ruptured capsule, dislocation or degenerative changes of the Morgagnian type.

e. Cases of spontaneous disappearance of incipient cataract without degenerative changes or marked difference in the refraction.

2. It is not uncommon for opacities of the crystalline lens or its capsule, the result of traumatism, to disappear, even when the capsule has been penetrated.

3. Too much stress can not be laid on the value of personal hygiene, treatment of associate local and general disorders, careful and repeated refraction, and the proper use of the eyes in arresting the progress of incipient cataract.

4. In certain complicated cases, secondary to grave nutritional disturbances, lenticular opacities may entirely disappear under appropriate treatment.

5. Generally speaking, the so-called "non-operative" treatment of cataract as practised by advertising char-

latans and irregular physcians is worthless, often distinctly dangerous, and consists in no beneficent measures not known and appropriately used by all reputable oculists."

On a Little-Known Method of Examining the Anterior Surface and Curvature of the Cornea.

STEPHENSON, SYDNEY, London. (*Ophthalmic Review*, Dec., 1902.) While examining the anterior parts of the eye by means of the small concave mirror and a $+20$ D. spherical lens, every one must have noticed a strikingly bright image of circular outline. For several years I have been in the habit of attaching some little importance to the clinical significance and diagnostic value of this image. It is, of course, an image of the edge of the mirror reflected from the surface of the cornea, and, like all images formed by convex mirrors, it is erect, negative, and smaller than the luminous objects of which it forms the reflection. It becomes larger the nearer one approaches to the eye under examinations.

Supposing it to be reflected from the central parts of a normal cornea, it is absolutely circular in outline. If on the contrary, the reflection be obtained from periphery of the cornea the circular outline is replaced by an oval figure, the major axis of which is horizontal if the transverse meridian of the cornea is approached, and vertical if the vertical meridian is approached. No well-defined or unbroken reflection can be got from the ocular conjunctiva in the neighborhood of the cornea, because that membrane furnishes anything but an ideal surface for reflection.

The mirror-reflex, when closely examined, is found to include (a) a smaller circular spot, which represents the central perforation in the mirror; and (b) a small, upright image of the flame, gas or electric light, as the case may be. (c) shifts its position within the mirror-reflex in the reverse direction to the movements of the mirror.

I have found an examination of the mirror-reflex of service in two conditions, viz.: (1) In disturbance of the anterior epithelium of the cornea; (2) in departures from the normal curvature of the cornea..

The first is well exemplified in the stippling of the anterior epithelium common in cases of commencing inter-

stitial keratitis, where the ring-reflex is broken up and distorted over the affected portion of the cornea, while normal elsewhere. The same thing is seen when portions of the epithelium have been lost after an injury to the eye.

When the normal curvature of the cornea is disturbed, the mirror-reflex is distorted in various ways, according to the exact kind of disturbance present. This may be seen, to some extent in cases of high regular astigmatism, but is much more pronounced in the alternations in curvature produced by an adherent leucoma or a conical cornea.

Examination of the mirror-reflex, it will thus be evident, is a convenient clinical substitute for a so-called keratometer, as Placido's disc, etc. It is in fact, a rough-and-ready means of examination. It is, however, convenient in actual work, because every surgeon who possesses a refracting ophthalmoscope possesses also a fair substitute for a formal keratometer.

Detachment of Corneal Epithelium

MENZIES, J. A., Manchester. (*Brit. Med. Jour.*, Nov. 1, 1902.) After referring to the literature and published cases of this condition, the writer continues as follows:

"There are two main types of the condition. In one the attacks usually commence in the early morning or during the night, or as a result of rubbing the eye. In this form the duration of pain is brief; in the intervals the surface of the cornea may appear normal, though even then it is possible to raise the epithelium with forceps. In the other type a patch of epithelium resembling a collapsed blister is seen, and the movements of the lid over this, acting on the nerve endings, give rise to the feeling of a foreign body being present. The epithelium may be clear or opaque.

In the majority of cases there is a history of injury. In the traumatic cases there has been a superficial injury to the cornea, following which the epithelium has not become firmly reattached. Then, as in dry catarrh, the cells become interlocked with those of the lid, so that when the lid is opened the epithelium is again torn off the cornea and pain is produced. In the first type things soon settle down, but in the second a blister is formed, and this gives way or an ulcer may result.

Szili has examined the detached epithelium and finds distinct changes in the cells themselves, and he has also

pointed out that when other methods of examination fail the ophthalmoscope will often reveal the lesion as an irregular shadow on the cornea.

Weiglandt proposes to add a third group for those cases where the detachment remains fairly permanent, and these may be called keratitis bullosa, of traumatic origin, and Dr. Menzies agrees with this.

The diagnosis depends largely upon the history, and the pain on opening the eye in the morning is very characteristic. In some cases fluoresceine is useful, but gentle pressure on the lower lid while the patient looks down is generally sufficient to allow of the slack epithelium being seen. Suspicion should be aroused when there is apparently much pain with little or nothing to be seen to account for it.

Treatment.—(1) Prophylactic: After an injury the eyes should be tied up, and if possible the patient should lie in bed with both eyes bandaged until healing has taken place. When detachment has taken place, for cases of the first group, the application of some ointment or fatty substance combined with massage, is generally sufficient. In the second group the epithelium should be thoroughly removed from the affected area and its neighborhood, and then the denuded surface may be scraped with a sharp spoon. The eye is bandaged and the patient put to bed for a few days until healing has occurred."

A New Departure in the Treatment of Hypopion Keratitis.

BURNHAM, G. HERBERT, Toronto. (*Brit. Med. Jour.*, Dec. 6, 1902.) The author's remarks deal solely with the most severe type of this disease—cases which had lasted from three to eight weeks, and included severe cyclitis as well as kerato-iritis, with extensive infiltration, considerable pus in the anterior chamber, synechiae, failure of atropin to cause mydriasis, deep injection, and severe pain. In such cases the treatment usually relied upon is chiefly local and constitutional remedies occupy a decidedly secondary place; such local agents often fail to check the downward progress or do this so tardily that great damage is the outcome.

"My treatment is purely constitutional, save the dropping into the eye of a four grain solution of atropine once

every day or second day, and the casual bathing of the eye with hot water or a little boric acid. It consists in the use of my combined treatment—viz., mercury and iodide of potassium taken internally and pilocarpine given hypodermically. For guidance as to the administration of this treatment I beg to refer to my papers in the *Archives of Ophthalmology*, the *Ophthalmic Review*, and the *Lancet*. (See abstract in these Annals, IX, 1900, p. 430.) The results have been truly satisfactory. The upward tend of the disease has soon showed itself in the pain being quickly relieved, in the infiltration having a sharper margin, in the pus in the anterior chamber lessening, and in the surrounding healthy cornea becoming brighter and clearer. And, moreover, the improvement once established ever remains, i. e., no relapse takes place. In one case that came very lately under my care and looked truly desperate before the disease could be checked a leakage began to take place through the ulcer so that the iris lay against the cornea. Even here the result turned out well and the adherent tissue has gradually given away, so that now there is a very fair anterior chamber.

In this treatment, moreover, the opacity left keeps ever growing less in size and denseness, so that finally it will disappear or only a non-disfiguring opacity be left. This treatment has several excellent features—the rapid relief of pain, the cure of the diseased condition with at least as great certainty as by the other methods and, I am fully persuaded, with greater, the gradual and uniform removal of the corneal opacity, and the absence of any pain immediately associated with the form of treatment used."

Binocular Magnifier for Use in Operating.

JACKSON, EDWARD, Denver. (*Journal Amer. Med. Assn.*, November 22, 1902.) "In using the binocular magnifier it is essential that the two lenses shall be kept the same height before the two eyes. Unless this is done binocular vision becomes impossible because of the vertical prismatic effect. To insure the keeping of the lenses in proper position the gutta-percha headband has been adopted to support the instrument. When this is obtained of the proper size softened by heat and molded to the head of the operator who is to use it, an ideal means of support has been secured.

To enable the operator to illuminate the field of operation and still keep both hands free for the operation, I have added a mirror to the instrument.

The condensing mirror of proper size and curvature gives as good lighting as the condensing lens ordinarily used for the purpose of focal illumination. With it the source of light may be placed behind the patient or in whatever position may be most convenient. After the mirror has been properly adjusted, a very slight movement of the head will give any modification of illumination that may be desirable; and, without an assistant, both hands are left entirely free for use in the operation.

The instrument is of great practical service in such minor surgery as the removal of misplaced lashes, or of foreign bodies embedded in the cornea; as well as in more serious operations, like the division of the capsule for secondary cataract."

The "Siderophone," a New Instrument for Discovering iron Splinters in the Eyeball, Constructed by Dr. Martin Jansson.

WIDMARK, J. E. Stockholm. (*British Med. Journal*, November 1, 1902.) Though the sideroscope and the X-ray apparatus are extremely useful in locating iron splinters in the eyeball and thus increasing the chances of extraction by the magnet, each has its inconveniences: The sideroscope must be carefully placed in a separate room, is greatly influenced by the neighborhood of electric currents, and is expensive. The X-ray outfit is also expensive and the patients must be sent to studios to be specially photographed. Dr. Martin Jansson, of Sweden, has constructed a cheap and simple instrument on the principle of Hughes' induction scales. The siderophone was tried in 23 cases of iron splinters in the eyeball and in 18 was successful in locating the the foreign body; in 5 instances the instrument gave a negative result, although Asmus' sideroscope clearly showed the existence of the piece of iron in the eye; it is therefore not as sensitive as the sideroscope but yet as valuable for those who cannot procure the latter. In some of the cases the position of the splinter was so precisely located that the foreign body was found immediately under the place of incision;

further it is probable that the sensibility of the instrument may be increased by modification in construction.

The siderophone is described as follows: "The principal part of the instrument consists of two cylindrical-shaped pieces of iron, united by a frame work of ebony, and placed so that the smaller piece is at right angles to the larger. The latter is surrounded by a middle-sized copper wire, which is connected with a small Helesen's dry element, fitted with an interrupter. The smaller piece of iron is surrounded with very fine copper wire, which leads to a common telephone trumpet.

When the electric current from the dry element is closed and the interrupter acts, the larger piece of iron becomes magnetic, and again influences the smaller piece of iron. This induces a current in the copper wire by which it is surrounded, and this secondary current is led to the telephone trumpet, where it is heard as a sound by the ear.

Now the smaller piece of iron is placed so that the axis of the larger piece divides it carefully in half. Thus two electrical currents of different directions arise which meet in the telephone; if these currents are equally strong, they neutralize each other, and there is no sound to be heard in the trumpet; but if the end is approached to the smallest iron splinter, the current is increased in the corresponding half. A sound is then produced in the telephone trumpet.

The adjustment of the instrument is done by a screw, which contains a small iron splinter. At a certain position of the screw the two currents are equally strong. If it is unscrewed, the current at the opposite end is stronger. The instrument is most sensitive when the above-named side is slightly overbalanced."

Contagious Conjunctivitis.

STANDISH, MYLES, Boston. (*Boston Med. and Surgical Journal*, October 2, 1902.) The writer reviews briefly the symptoms and etiology of acute catarrhal conjunctivitis; although self-limited in its course, he finds that dusting finely powdered and dry iodoform into the conjunctival sac at intervals of twelve hours will abort the disease.

The subject of trachoma is next taken up and the differential diagnosis between this affection and follicular conjunctivitis given. Every evidence seems to point to

the contagiousness of trachoma and the view this affection is not contagious is probably dependent upon confusion between it and follicular conjunctivitis. The writer describes the symptoms and treatment and comments upon the great improvement effected in management of these cases by modern treatment. Figures are given which show that for the five years previous to 1885, there were 35,000 cases of trachoma treated at the Massachusetts Charitable Eye and Ear Infirmary of Boston (3.5 per cent.), while for the five years preceding 1902, there were only 11,000 cases or 1.2 per cent. This diminution was due to exclusion of trachomatous immigrants and improvement in treatment. The expression treatment enables patients to leave the hospital well on the road to recovery and passed the actively contagious stage.

Similar improvement in the results of treatment of ophthalmia neonatorum are noted, although owing to inadequacy of the records, no figures are given regarding the number of eyes lost twenty years ago. Much of this improvement was due to the fact that such infants are now admitted to the hospital where the general health is looked after and local treatment more faithfully carried out. Until recently the favorite remedy was nitrate of silver in 1 per cent. or 2 per cent. solution.

Since the introduction of protargol the number of unsuccessful cases has been diminished. In fifty cases in which nitrate of silver was used exclusively there were three that had clear corneae upon admission which subsequently developed ulceration of the cornea sufficient to interfere with vision (6 per cent. of unsuccessful cases). The strength of the protargol has been constantly rising from a 4 per cent. solution in the beginning to an habitual use of 20 per cent. to-day. The routine method of applying the protargol was simply to part the lids and flood the conjunctival sac with the solution every three hours.

The fifty cases in which silver was relied upon remained in the hospital an average of 23 1-2 days; the last fifty cases treated with the stronger solution of protargol presented an average of 16 1-2 days of hospital

treatment, showing an additional advantage in favor of protargol.

When only one eye was infected the other was protected by a sort of cocoon dressing: "The second eye is thickly covered with iodoform, and over this is constructed a cocoon covering with cotton and collodion. The object in using the iodoform is, that if the edge of the dressing becomes loosened and the secretion passes under the protective covering, it is immediately absorbed and rendered innocuous by the iodoform before it reaches the protected eye. We have not found any of the substitutes for iodoform equally efficacious for this purpose."

The writer points out the great advance in the treatment of diphtheritic conjunctivitis since the introduction of antitoxin, the retention of vision after this affection not being formerly expected. Statistics of 35 cases treated with antitoxin are given; in only three cases was the cornea lost or sufficiently injured to produce absolute blindness, and these three cases were complicated with measles. Of ten cases treated at the Massachusetts Eye and Ear Infirmary, there was in no case serious impairment of vision and seven presented clear corneae. Of the twenty-five cases treated at the South Department of the Boston City Hospital, sixteen had the same fortunate result.

The Micro-Organisms Found in the Conjunctival Sac and in the Various Forms of Conjunctivitis.

CORSINI, GERMANO, Parma, Italy. (*Ophth. Record*, October, 1902. Translated by Casey A. Wood of Chicago.) The subject is thoroughly discussed under the following headings:

- Acute contagious conjunctivitis.
- Blenorrhagic "
- Pseudo-membranous "
- Conjunctivitis due to streptococci.
- Pneumococcus conjunctivitis.
- Trachomatous "
- Diplobacillary "
- Rare forms of bacterial "
- Acute catarrhal " "

The conclusions arrived at are:

"I. The microscopical examination of the conjunctival

secretion is of great value in diagnosis and in some cases is necessary to determine the precise character of a conjunctivitis. When the results obtained are unsatisfactory doubts may almost always be cleared up by a further study of cultures in various media made directly from the conjunctival exudates.

II. The bacteriological report is a sure means of classifying the affection; many cases of conjunctivitis which present all the clinical data necessary to place them in one class or another, when studied from the bacteriological standpoint, often represent attenuated cases of a conjunctivitis due to quite a different pathogenic agent, which, in a condition of greater virulence, would have produced an exudation of a very grave and deleterious nature.

III. The microscopic examination is not equally satisfactory or easy in all forms of conjunctivitis. Fortunately it is comparatively certain in the usual examples of catarrhal conjunctivitis. It is not difficult to deal with diplobacilli, streptococci and staphylococci; in the case of the pneumococcus and of the pseudo-diphtheritic forms special care and some patience are required."

The Role of the Toxins in Inflammations of the Eye.

RANDOLPH, ROBERT L., Baltimore. (*The American Journal of the Medical Sciences*, November, 1902.) The writer gives the results of experiments which showed that pathogenic bacteria, even those for which toxins had not previously been satisfactorily demonstrated, do harm through the action of specific soluble poisons. His conclusions are:

"1. Bacterial toxins, so far as tested, when instilled even for many hours into healthy conjunctival sac were found incapable of producing inflammation or causing other injury.

2. The same toxins when injected into the tissue of the conjunctiva or into the anterior chamber invariably set up local inflammation, the extent and intensity of the inflammation varying to some degree, according to the species of bacterium yielding the toxin.

3. Bacteria which has not previously been proven to produce soluble toxins were found to produce them even in young cultures, and it is suggested that injections of bacterial filtrates into the eye, particularly into the con-

conjunctival tissue, constitute a more delicate biological test for the detection of certain toxins than the tests usually employed for this purpose.

4. The experiments recorded in this paper furnish additional examples, in a comparatively new field, of the importance of toxins in explaining the pathogenic action of bacteria, and likewise emphasize the etiological significance of injuries of the covering membrane of the eye in favoring the actions of toxins and of bacteria."

On the Use of Large Doses of Salicylate of Sodium and an Attempt to Explain its Action.

GIFFORD, H. Omaha. (*Ophth. Record*, December, 1902), thinks that although sodium salicylate is commonly used in rheumatic and some other inflammations of the eye, there are certain classes of cases when its advantages are not sufficiently appreciated and that usually the dose given is too small to accomplish the best results.

He has found the average patient will stand during the waking hours, i. e., 7 A. M. to 10 P. M., one grain to each pound of weight, and gives it as follows: one ounce of the salicylate is dissolved in four ounces of brandy, which gives approximately 15 grains to the teaspoonful which is given each $1\frac{1}{2}$ hours in about $\frac{1}{8}$ glass of water followed by the same amount of water or a cracker to get rid of the taste; it is best to begin with a little less amount at first and the patient should go to bed after the third or fourth dose and is allowed to go without the drug for a day or two each third or fourth day; the patient is warned to keep the head wiped dry if there is much perspiration as a severe cold may be taken. If the stomach rebels a change to giving the drug in capsules followed by the brandy and water may be resorted to. The temporary blindness and deafness is extremely exceptional and need have no more weight than the blindness which results from moderate doses of quinine; some cases of delirium have been reported following its use.

The writer has tried asparin with about the same unpleasant symptoms when enough to produce good results was exhibited.

In all non-specific inflammations of the iris, ciliary body, sclera and episcleral tissue, whether of rheumatic origin or not, the writer believes salicylate of sodium is

the most important drug; it is of great value in acute retrolbulbar affections of the optic nerve; also in acute glaucoma as recommended by Sutphen. In those cases classed as optic neuritis, there are so many conditions not really inflammatory, but due to stasis or thrombosis, in which more faith is placed in large doses of the iodides than the salicylate, as also in posterier chorioretinitis. Special stress is laid upon the use of salicylate in sympathetic ophthalmia, post operative or traumatic inflammations of the iris and ciliary body, interstitial keratitis and herpes cornea.

In sympathetic ophthalmia G. places it ahead of mercurial innunctions but frequently uses the two alternately. Emphasis is laid upon the necessity of keeping up the use of the salicylate one or two days a week for a long time after the last sign of acute inflammation has disappeared.

In interstitial keratitis which is plainly the result of hereditary syphilis, the action of the salicylate is much less active and certain than in those that show no marked signs, but many times does more good than both iodides and mercury. Those cases of iritis which not unfrequently occur after cataract extraction respond most promptly to generous use of the drug

In herpes cornea the use of the salicylate in connection with local applications of iodine give relief where hot applications and atropine fail.

In explaining the drug's action, the rapid elimination from the body by the kidneys is against it being a germicidal or germ hindering substance as from a 1:1000 to 1:500 solution is necessary to check the growth of ordinary white and yellow pus cocci very decidedly. The theory of Oltramare is more plausible, "according to which a local depletion is produced by general capillary dilatation which the salicylate causes." Reference is made to the remarkably favorable influence which an optico-ciliary neurectomy (in which a large part of the blood supply to the eye is cut off) exerts upon the traumatic inflammations, and the action of cardiac depressants in checking colds. The diaphoresis produced is considered as a secondary factor in the good influence produced by the drug.

Some Remarks on Argyrol (Silver Vitelline).

ALT, ADOLF, St. Louis. (*Amer. Jour. of Ophthalmology*;

Oct., 1902.) After giving the properties of this new silver preparation (see *thèse Annals* July, 1902, p. 492) the writer states that he has given this substitute for nitrate of silver an extensive trial considers it of theraputic value. "I have used it in 5 per cent. solution in a number of cases of chronic and subacute conjunctivitis, and in the cases of trachoma after the removal of the granular tissue. It is non-irritating, causes no pain, and in every case its application has brought about a visible improvement. I have not used it long enough to know whether and in what time it is likely to cause argyrosis; but, on account of its extreme solubility it may perhaps be less likely to bring on this disagreeable discoloration of the conjunctiva."

**A Simple and Effective Method of Determining the
Degree of Deviation in Squint.**

BLACK, NELSON M., Milwaukee (*Ophth. Record*, Nov., 1902), describes his apparatus consisting of a wooden base supporting an upright. At right angles to the center and top of this upright is attached an arm which can be turned to the right or left at the center of the upright; on the back of this arm a scale of degrees is marked. The light is a long miniature electric lamp that can be flashed on and off with a push button. On the arm is a small marker to attract the patient's attention. The scale is made by extending the radii through the arc of the circle to the arm which forms the tangent, the radius being 60 cm., or the distance of the patient's eyes from the light.

To measure the deviation, the patient is placed in front of the apparatus with the elbows resting on the table. The distance of the eyes being regulated by a cord to which is attached a ring which is held on the little finger at the orbital margin; the light being flashed on will at once attract their attention, the position of the corneal reflex is noted in the fixing eye and the patient directed to look at the marker, which is moved to or from the upright until the reflex in the deviating eye is relatively in the same position as it was in the fixing eye when looking at the light; by directing the patient to look first at the light and then at the marker, the reflex can be located exactly in the deviating eye and the degree read off on the back of the arm opposite the position of the marker. With small child-

ren or babies, the mother or nurse holds them on the lap with the child's head between the hands; a match is lighed and held over the marker at which the baby will naturally look; this is moved back and forward and, the eletric light being flashed on and off from time to time until the cornea reflex is in relatively the same position in the deviating eye. The light can be flashed on and off so quickly that the child can not have time to change its gaze from the lighted match to the eletric light.

ABSTRACTS FROM SPANISH AND PORTUGUESE OPHTHALMIC LITERATURE.

BY

ALBERT B. HALE, M. D.,

CHICAGO, ILL.

(Quarter Ending December 31, 1902.)

Treatment of Senile Ectropion by Terson's Method.

OBARRIO, Ecuador. (*Anales de Optalmologia* July, 1902.) A modification suggested by Obarrio is applicable especially to cases of an atrophic character, where much force is needed to return it to its normal position. Here the conjunctiva is resected away so as to bring the lid closer to the bulbar conjunctiva, and at the temporal side of the eye the skin is cut away in a triangular fold, but higher up than in Terson's operation and with the apex pointing more toward the top of the head, closing this gap by stitches, brings the lid into place, in such cases, better than the original flap of Terson.

Implantation of Fat (tissue) for Ocular Prothesis.

VELEZ, Mexico. (*Anales de Optalmologia*, July 1902) Velez reports three cases: 1. In an old enucleation—fat from gluteal region—success. 2. Evisceration and immediate implantation from gluteal region, success. 3. Enucleation with insertion of fat, which was covered by granulation subsequently and gave hope of success.

Dermo-lipoma of Conjunctiva.

DEMICHERI, Uruguay. (*Anales de Optalmologia*, August, 1902.) Demichieri reports two cases. One of the semi-lunar fold, one in the inferior fornix. In the first there was a decidedly angiomaticous character. In the second there was evidence of dermoid structure. Both occurred in adult young men.

Pterygium as Diagnostic Evidence of Alcoholism.

CHACON, Mexico (*Anales de Optalmologia*, September, 1902), makes this the thesis of his article. He does not

accept without reservation the theory of pterygium observation from corneal injury or ulcer, nor from pinguecula. He claims that in addition to the usual causes (exposure to dust and such external irritants), there is in Mexico at least, as long ago predicated by Jiménez, decided tendency in alcoholics toward pterygium. A certain discoloration of the conjunctivae bulbi is in Mexico commonly called an alcoholic blot (especially where pulque is much drunk!).

Examined either way the rule is a good one. Alcoholics will often show the beginnings of a pterygium—those with pterygium will often be shown to exhibit signs of alcoholism.

Kerato-Conjunctivitis Provoked by the Toad.

SANTOS FERNANDEZ, Cuba (*Anales de Optalmologia*, October, 1900), has an interesting note concerning infection from the common toad (of the tropics). He refers to a case reported by Staderini y Addario of Italy (*Annali di Ottalmologia*, 1889), where the poisonous secretion from a toad produced conjunctival and corneal irritation, moderate ptosis, strabismus and diplopia. In his own experience the patient acknowledged the source of infection, but it was not till later considered to be the cause of the edema, etc., which resembled a rheumatic tenonitis. Later these developed a superficial abscess of the cornea, and the author is positive that the irritation was due to the toad.

Excessive Hyptonia in Some Cases of Simple Cataract Extraction.

SANTOS FERNANDEZ, Cuba (*Archivos de Optalmologia* Barcelona, August, 1902), discusses the occurrence of excessive hypotonia in some cases of simple cataract extraction, especially at the moment of delivering the lens. This he noticed at about the ratio of 5 per cent., chiefly in the ages from fifty to seventy. In only one case was there the least suspicion of disturbance of vitreous. In a few cases there was in addition a depression of the cornea noticed for 20 minutes. He reports in detail 26 cases, and propose three probable causes for the phenomenon, which, after all, resolve themselves into one cause. (1) Discission made by the knife,

which dislocated the lens in its torn capsule; (2) a certain tendency not to make the capsular incision so peripheral that the lens would escape through a hernia of the iris; (3) *cocain*. The effect of the first two are due to some idiosyncrasy of the individual when the third is used.

Tendinous Shortening by Strangulation.

AGUILAR BLANCH, Valencia (*Archivos de Optalmologia*, August, 1902), has a note on what he calls tendinous shortening by strangulation in the operation for strabismus. This takes the place of advancement. The operation is divided into three steps: (1) Conjunctival incision and exposure of muscular tendon; (2) catching the tendon on a hook and freeing it from all its sclerotic and lateral attachments; (3) formation of a fold which is made permanent by a loop of thread. The measurement of connection to be gauged by the actual effect on the eye, for when they are strangled by the fold of tendon, then is the time to take the tuck.

[N. B.—The operation is in principle not different from the tucking operation of Prince, but the author has devised a clever instrument which pulls on the tendon and at the same time measures in mm. the amount of tendon involved, so that so much tendon tucking is equivalent to so much variation in strabismus.—A. B. H.]

Spring Catarrh.

DEMICHERI, Montevideo (*Archivos de Optalmologia*, November, 1902), reports a case of spring catarrh (papilloma of conjunctiva) of a very pronounced type, in which he twice extirpated the papillomata (with no lasting effect) and submitted them to examination. The epithelium was stratified pavement variety chiefly; there were numerous mucus cells, the blood vessels were numerous. But in the large papillomato, the essential differences were (1) the epithelium was thicker; (2) the subepithelial cellular covering is denser and fibrous and the vessels thinner; (3) there were no mucus cells.

The author is convinced that spring catarrh is not trachoma (he has seen 20 cases of spring catarrh in 5,500 patients). His diagnostic sign, distinguishing this from trachoma, is inherited from deWecker—a distinct zone of free conjunctiva separating it from the cul de sac (fornix).

The cornea is rarely invaded. Pericorneal hyperplasia leads on any movement of the eyes or lids—washing, etc., to ocular congestion. Alcohol in some cases leads to congestion. One young woman complained of exacerbations at the menstrual epoch. Calomel, suprarenal solution, curettage, and perhaps electrolysis, have been the best treatment methods.

Treatment of Prolapse of the Retina.

ALVARADO AND ALVAREZ, Valladolid (*Archivos de Optalmología*, November and December, 1902), have examined the subject thoroughly and report several cases. They seem to have in their neighborhood (64 in 4,991 cases) a greater proportion 12:1000 than in other parts of the world. This they ascribe to the general neglect among the people of eye troubles, so that a case is seen only when it has progressed very far. They also think that chorioretinitis is a predisposing cause. (Disease of the uveal tract.)

They analyze in detail five cases in which various treatments were tried. They find no one common cause. Their conclusions are not that cases are hopeless or that they are cured spontaneously, if at all, but that there is not distinct and exclusive treatment.

ABSTRACTS OF GERMAN OPHTHALMIC LITERATURE.

BY

ROBERT L. RANDOLPH, M. D.,

BALTIMORE, MD.

AND

CHARLES ZIMMERMANN, M. D.,

MILWAUKEE, WIS.

(Quarter ending December 31, 1902.)

Visual Disturbances after Hemorrhages.

SINGER, DR. K., Salzbrunn. (*Beitr. z. Aug.* Heft 53.)
S. compiled, in tabular form, 196 cases from literature, of which 106 were collected before, in 1876, by Fries, and reports 2 observed by himself.

In the first case the sight failed seven days after a profuse metrorrhagy in a woman, aged 45, who had myoma of the uterus. Optic discs pale, outlines ill defined. R — fingers at 1 1/2 m. L. 3 m. The lower halves of the V. F. were lacking, with absolute central scotomata. Recovery after four weeks. VR = 2/3, L. 1/2.

Case 2: Sudden blindness of left eye after hematemesis from an ulcer of the stomach in a man, aged 46. Optic disc pale, retinal vessels thinned. Pupil does not respond to light. Two and one-half years later VL = 0, R perfectly healthy, V = 5/4. Left pupil does not react to light, optic disc snow white, bloodvessels narrowed. A few cases, observed in animals, are quoted, and the remainder of the paper is devoted to statistics and casuistics. Hemorrhages of the stomach and uterus give the greatest percentage. The visual affections took the following course: in 55 cases of intestinal hemorrhages no improvement or impairment in 28 (50.9 per ct.), improvement 22 (40 per ct.) recovery 5 (9.1 per ct.), in 50 cases of uterine hemorrhages impairment or no improvement 21 (42 per ct.),

improvement 23 (46 per ct.), recovery 6 (12 per ct.), in 8 cases of epistaxis impairment or no improvement 5 (62.5 per ct.), improvement 1 (12.5 per ct.), recovery 2 (25 per ct.), cases of artificial bleeding impairment or no improvement 12 (48 per ct.), improvement 8 (32 per ct.), recovery 5 (20 per ct.); in 5 cases of wounds impairment 2 (40 per ct.), recovery 3 (60 per ct.). The treatment must be directed to the origin of the hemorrhage and to strengthening of the whole organism. Injections of strychnia are recommended. The anatomo-pathological investigations, so far, have not thrown any light on the pathogenesis. The ophthalmoscopic symptoms, observed some time after the hemorrhages, were optic neuritis and atrophy, in some cases more or less marked excavation of the disc. The bloodvessels were sometimes tortuous, the arteries narrow, the veins enlarged, sometimes normal. In a few cases pulsations were observed. The retina showed edema, more or less recent hemorrhages, partly in patches, partly in radiating streaks near the disc, at the macula or other places.

A Contribution to the Pathology and Therapy of Frontal and Ethmoidal Sinusitis and Their Orbital Complications.

AXENFELD, PROF. TH. Freiburg. (*Deutsche Med. W.* 1902, No. 40.) Inflammations of the orbit chiefly originate in the periorbital nasal sinus. If, after evacuation of pus through an incision along the eyebrow, the orbital roof is found not perforated, the frontal sinus must be opened and the radical operation performed in all cases of chronic frontal sinusitis, but, according to A., not unconditionally in acute sinusitis. Here the possibility exists that the original affection of the sinus, although leading to a severe orbital suppuration, has spontaneously healed and does not require any interference.

A. illustrates this by a case of acute suppuration from the right nostril following a severe attack of influenza and producing otitis media perforativa and a subperiosteal orbital abscess below the frontal sinus, as typically found after frontal sinusitis. The orbital abscess healed within two months after operation. As the patient, however, still complained of frontal headaches, a probatory opening of the frontal sinus was made, but the latter was perfectly normal.

In another case the purulent frontal sinusitis, complicated by a severe orbital abscess, was limited to one side, although there was only a thin septum of mucous membrane between both sinus. This confirms the view of Kuhnt that propagation into the orbit cannot be attributed to increased pressure in the sinus, else the membranous septum in this case would have been bulged and an affection of the sinus of the other side would have ensued, but that the infection is conveyed along the emissaries of the bones.

On the Causes of Primary Glaucoma.

LEVISON, DR. GEO., Berlin. (*Berl. Klin. Woch.*, 1902, No. 41.) L. demonstrates in his sections of an eye, affected with primary glaucoma, as the cause of the glaucomatous attack, a mechanical obstruction of the spaces of Fontana, produced by proliferation and condensation of the connective tissue in the ciliary body which altered the position of the iris with narrowing of the anterior chamber. Every dilatation of the pupil in such an eye must have serious consequences by shortening and thickening the iris tissue, which may entirely obstruct the narrowed sinus, stop the outlet and thus evoke an acute attack of glaucoma. These conditions are in striking concordance with the anatomical investigations of Fuchs, Elschnig and Kerschbaumer, and explain very well the conditions found in absolute glaucoma, as well as the first clinical symptoms. Hence L. thinks he is justified in considering as cause of a series of primary glaucomatous cases a solid enlargement of the ciliary body and its processes, not of all, since glaucoma is a symptom which may be elicited in various fashions. The anatomical conditions are illustrated by drawings.

A Visimeter.

MAYEDA, DR. UJUHIKO, Nagoya, Japan. (From the eye clinic of the University of Giessen, *Deutsche Med. Woch.*, 1902, No. 42.) This visimeter consists of a rectangular case 31x120x12 cm. with black walls and a quadrangular window, 11 cm. square. The circular test objects of Landolt of 10 different sizes are printed on a paper, 5 m. long, 13 cm. wide, which runs over two rollers. The physician, standing next to the patient, brings the various numbers of the tests into view by moving the rollers with

cords. The advantages are that the patient sees the various signs at the same height, and does not know their succession, so that simulation is not likely to occur. No assistants or walking to and fro are required. It is very useful for the examinations of illiterates, children and large numbers of people; it contains more test objects than the ordinary test types, and does not become soiled, as it is not constantly exposed to air and light.

Spiritus Saponatus as Disinfectant of Surgical Instruments.

GERSON, DR. KARL, Berlin. (From the bacteriological-microscopical laboratory of Dr. C. S. Engel, Berlin, *Deutsche Med. Woch.*, 1902, No. 43.) G. proved, by bacteriological experiments, the reliability of the following procedure: Cotton, soaked with spiritus saponatus, is tightly wound around the blades of surgical instruments. The latter thus remain aseptic for any length of time and after removal of the cotton, are ready for use. After evaporation of the alcohol the soap forms with the cotton an airtight cover.

On the Importance of Venereal Diseases in the Etiology of Blindness.

WILDMARK, JOHAN, Stockholm. (Read before the society of Swedish physicians, November 26, 1901.) Out of 236 pupils of the institute for the blind at Stockholm in 1879-1896, 24.6 per cent. had become blind from blennorrhea, out of 245 blind patients of the eye clinic and W.'s private practice 5.3 per cent. Blindness from ophthalmia neonatorum et adultorum amounts to 6.52 per cent. in Sweden. Since the introduction of Credé's method a great improvement is noticeable. Only 0.07 per cent., i. e., 9 cases, occurred among 12,357 patients of the polyclinic during the period from 1898 to 1900.

Although the exact number of syphilitic eye affections cannot be given, the latter play no less an important part. Since there is scarcely any part of the visual organ which may not be affected by syphilis, quite a number of cases of blindness, due to syphilis, appear under various headings in the statistics. In W.'s statistics primary atrophy of the optic nerve, which in most cases is due to syphilis, amounts to 7.96 per cent., exudative chorioiditis 0.41 per cent., retinochorioiditis 5.3, iritis and cyclitis 1-1.5 per cent and 2 to 3 of the 11 per cent. of blindness attributed

to diseases of the brain and the meninges, altogether 17 to 18 per cent., from which 3 to 4 per cent. may be subtracted, considering the fact that not every case of atrophy of the optic nerve, chorioiditis or retinochorioiditis is of syphilitic origin. If the 6.52 per cent. of gonorrhoeic ophthalmia are added the result is that out of 245 incurable blind 20 per cent. lost their sight through venereal affections. Energetic and early treatment of syphilis with mercurials is of the greatest importance to prevent tertiary syphilitic eye affections.

On the Etiology of Myopia.

WILDMARK, JOHAN, Stockholm. (Reprint). W. sees the chief cause of myopia, not in increased accommodation or convergence, but in the strain of the macula lutea and the consequent alterations at the posterior pole. If, by some cause, as maculae corneae, uncorrected astigmatism—V of one eye is deteriorated before the child goes to school, myopia generally develops in the good eye, no matter whether the former participates in fixation or shows convergent or divergent squint. Even after enucleation of one eye, typical myopia may develop in the other. The alterations at the macula may consist in hyperemia, softening, yielding to the intraocular pressure, and atrophic changes. Full correction of myopia, if accommodation and V are good, is the best prophylactic as it will relieve the work of the retina by promoting binocular fixation and producing clear images on the retina.

W. does not deny all influence of convergence on the development of myopia, but considers it of inferior importance. He tries to aid it, however, with correction in cases of muscular asthenopia. W. derived his conclusions from his own observations, and, for illustration, enumerates 100 cases of monocular or binocular myopia with anisometropia of at least 2 D. from his private practice.

On Scotoma Scintillans and Migraine.

JOLLY, PROF. F., Berlin. (*Berl. Klin. Woch.*, 1902, Nos. 42 and 43.) J. communicates an auto-observation of scotoma scintillans. In his ninth year his left eye was hit with a stone and became amaurotic. While at school and at the university, he suffered from typical attacks of migraine, occurring every few months, without optical phenomena, excepting photophobia. At the age of 27 he

was very much frightened by the first attack of scotoma scintillans. After a few years another one set in, followed by others at short intervals, altogether several hundred. Feeling tired or hungry, general exhaustion, eyestrain, glaring light acted as predisposing causes. The phenomenon commences with a visual disturbance, a small blur laterally from the fixation point, which, in the second stage, is replaced by a glaring, flickering scotoma, bordered by the characteristic zigzag, fortress like, lines. It more and more recedes in larger circles toward the periphery, and may reach the middle line, but never crosses it. Finally it is reduced to a flickering indistinct arc of light in the periphery of the visual field, which soon disappears and leaves a certain sensation of glaring. Occasionally two attacks immediately succeeded one another, first on one side of the point of fixation then on the other. They never occur simultaneously on both sides of the point of fixation. Several times the flickering took place in reversed order. There was no predilection for right or left side. Within nine months J. had nine attacks on the left side and fifteen on the right. In 11 of these 24 attacks headache occurred and lasted from one-fourth to three hours, in 13 no headaches. In the five attacks with scotoma on the right side the headache was three times on the left, once on the right and once on both sides. In the six attacks with scotoma on the left side, the headache was five times on the right, once on both sides, which shows that the headache must not unexceptionally occur on the side, opposite to the scotoma, as stated by many others suffering from scotoma.

The attacks were less and less associated with headaches in the last few years, but J. has a feeling of pressure in his right eye during the flickering, no matter whether the scotoma is on the right or left side. Nausea or lack of appetite were never observed, but his face becomes pale and assumes an expression of exhaustion. The scotoma is strictly hemiopic, paracentral, never encroaching upon the point of fixation, and migrating generally from the center toward the periphery, exceptionally vice versa.

With regard to the place of the optic path in which this peculiar subjective phenomenon originates, J. reached the following conclusions:

1. The most frequent form of scotoma scintillans, the hemiopic, does, in all probability not originate in the brain, certainly not in the cortex, but in the primary optic path, i. e., optic tractus or the region of the corpus geniculatum externum.

2. The binocular central and the hemiopic scotoma or encroaching upon the median line, are due to alterations in even more peripheral portions, probably the chiasm.

3. The more monocular scotomata are produced by affections of the optic nerve or retina.

On Photography of the Fundus.

THORNER, DR. W., Berlin. (*Berlin Klin. Woch.*, 1902, No. 43.) Th. constructed a new apparatus, the description of which must be read in the original. His photographs of the fundus of the cat represent the papilla and the vessels very well, and allow of a very exact measurement of the relative size of the bloodvessels. Th. emphasizes the importance of this for general medicine, as the retinal vessels participate in many alterations of the vessels of the brain. Thus the changes of growth, the action of drugs, variations of temperature, electric currents, cutting or stimulation of nerves may be studied in the living animal on photographs of the background, taken at short intervals, by exact measurements of the vessels.

Remarks on the Etiology and Prophylaxis of Botulism.

GUILLERY, DR. H., Coeln. (*Deutsche Militaerarztl. Zeitschr.*, Nov. 11, 1902.) G., who intends to discuss the visual disturbances due to botulism more thoroughly at another time, shows in this paper the fallacy of the opinion of von Ermengem, Fischer and others that the poison, contained in meat of healthy animals, of abnormal appearance, smell or taste, especially rancid taste, is destroyed by the usual mode of roasting or boiling. The poison has in all probability its origin in the decomposition of albuminous substances, and the only safeguard against it is to principally reject meat in that state.

Ulcus Corneae Septicum.

BOCK, DR. EMIL, Primarius, Laibach. (*Allgem. Wiener Medicin., Zeitung*, 1902, Nos. 40 to 42.) B. selected this

term for hypopion-keratitis of Roser, *ulcus corneae serpens* of Saemisch and *abscessus corneae* of Arlt, as it expresses better the most important feature of this affection. Pneumococci, the morbid agents of the disease, are generally in great quantities, suppressing currence of staphylococci and streptococci, which predominates in other ulcerous affections. B. gives a very good description of the disease in clinical, pathological and etiological respects, emphasizing the combination of the septic ulcer with affections of the lacrimal sac, conjunctiva and lid borders which he found in 229 out of 300 cases. His treatment consists in galvano-cauterization as early as possible under holocain and kalium fluorescinicum. Out of 300 cases 229 were cauterized with only three losses by panophthalmitis; in 39 the iris was incarcerated in the resulting scar. The patient is kept in bed for a few days, excepting old people, one or two times a day scopolaminhydrobromin, 1.1000 is instilled, iodoform or xeroform dusted on the ulcer and the eye protected with a wire mask. After subsidence of the suppuration a bandage is applied. Saemisch's section is discarded as insufficient and being frequently followed by increased tension. Scraping of the ulcer is unreliable, the application of carbolic, lactic or nitric acids is effectual but not controllable. Miotics aggravate the irritation, save in increased tension. Subconjunctival injections promote the metabolism of the eye but have no bacterioidal action. In children B. had the best results with scopolamine, iodoform and warm applications, only two failures in 51 cases.

The Osteoplastic Operations for Empyema of the Frontal Sinus.

CALDEMEYER, HERMANN, Lengerich, I.W. (*Inaug. Dissert.* Heidelberg, 1901.) After a historic introduction, the author discusses the etiology, the symptoms necessitating an operation and the advisability of an early operation and describes the different methods of Praun-Nebinger, Jansen, Killian, Luc-Ogston, Kuhnt, Herzfeld, Barth and Czerny. In the osteoplastic operation of Czerny a skin-bone flap is formed and reflected either upward or downward. The outlet of the frontal sinus toward the nose is enlarged and the sinus drained through the latter and through the wound. It gives the best cosmetic results as

illustrated on 11 cases from the clinic of Prof. Czerny, which are reported in detail.

New Formation of Connective Tissue of the Optic Disc—Meniscus of Connective Tissue (Kuhnt.)

MAYEDA, DR. UZNIKO, Nagoya, Japan. (From the eye clinic of Prof. Vossius, at Giessen. *Beitrag zur Augenh.*, No. 54.) M. describes 25 cases, collected from literature, and 19, observed at the eye-clinic at Giessen. The affection consists in a membranous formation of connective tissue of irregular form and thickness, of snow white color, which gives a glaring reflex, at the optic disc or the adjacent portions of the retina. Most frequently it occurs at the center of the disc and covers the central physiological excavation and the entrance of the central bloodvessels, but also at the periphery or at both places, or it may extend almost over the whole disc and a part of the adjacent retina. Its size varies from one-eighth to twice the disc, and it may be combined with other changes in the eye. Four cases showed amblyopia. Of the 44 cases 18 were emmetropic, 20 ametropic, 6 not ascertained. The author enumerates the views of various authors as to the anatomical character of this formation. His opinion is that it is a congenital affection and is perhaps a remnant of the connective tissue surrounding the hyaloid artery. It must be distinguished from retinitis proliferans, which, as a consequence of hemorrhages of the vitreous, is always accompanied by impairment of sight.

Casuistics of Ocular Tumors.

AHLSTROEM, DR. G., Gothenburg, Schweden. (*Ibidem.*)

1. Subconjunctival cavernous angioma of upper eyelid, 5 mm. long 10 mm. wide, 3 mm. thick, with lobulated surface, projecting from under the lid border. The conjunctiva passed continuously over the tumor which was movable with it. Extirpation with scissors and pinchers, devised by Galezowski for the excision of the fornix in trachoma, and suture of the conjunctival wound. Recovery after five days. A drawing illustrates the histological structure of the tumor.

2. Sarcoma of the lacrimal gland. Extirpation through an incision along the upper temporal orbital margin. In the anterior portion glandular tissue is found, which, farther back, is replaced by fibrous tissue and accumula-

tion of small round cells. Three-fourths of the tumor consist of typical round cell sarcoma.

3. Tuberculosis of the iris. Boy, aged 7 months, looks very emaciated, rales over left lung, spina ventosa of finger of right hand, no swollen glands. His mother, who had nursed him until a month previously, was dying from phthisis to which other members of the family had succumbed. An oval yellow red tumor, 6 mm. in diameter, extended not quite from the ciliary beyond the pupillary margin of the upper external quadrant of the iris, without touching the cornea which was somewhat hazy, with pericorneal injection. The surface of the tumor was lobulated, a few vessels running over it. Pupil small, scarcely reacted. Media, fundus and T. normal. Eye not painful on palpation. It was first noticed a month ago as a small nodule of the size of a pin's head and had grown ever since. As enucleation was refused it was removed by iridectomy. After two months relapse in the scar, filling the coloboma; infiltration of the remaining iris with nodules of the size of a pin's head to that of a grain. General condition much worse. The tumor consisted of granulation tissue and giant cells. Tubercle bacilli could not be found.

4. Melanosarcoma of the iris. About a year ago a small black spot was observed in the iris of a boy, four years old, which has grown to a black oval tumor, overlapping, with its apex, the pupil, but not quite reaching the ciliary border. At one place it touched the cornea. Since enucleation was refused the tumor was excised by iridectomy. After an uneventful recovery the eye remained well for four years. Then it was struck by a piece of wood and had to be enucleated on account of chronic iridocyclitis. No remnant or new formation of the tumor could be detected in the enucleated globe.

5. Leucosarcoma of the ciliary body in a woman, aged 38. $V=6/24$ T + 1. Numerous dilated veins on the temporal portion of the sclera. On oblique illumination a brownish red, round tumor could be seen behind the temporal portion of the lens; media clear, fundus normal, as far as the view was not obstructed by the tumor. Defect of visual field inward as far as 30° from the fixation point. Enucleation. The tumor commences immediately behind

the ciliary margin of the iris at the level of the periphery of the lens, and extends 11 mm. backward, involving one-third of the ciliary body. It is greyish white without any pigmentation. Behind the tumor the retina is detached up to 3 mm. from the papillary margin, but is otherwise normal, as well as the iris and the other parts of the eye. The iris, at the region of the tumor, is pushed toward the cornea, the sinus is open, the canal of Schlemm obstructed. The tumor consists of small round cells with one or more large nuclei, scanty fibrillar intercellular substance, numerous bloodvessels; the walls of the smaller ones are infiltrated with tumor cells. The histological conditions of all five cases are illustrated by drawings.

On Photography of the Fundus Oculi.

DIMMER, PROF. DR. F., Graz. (*Berl. Klin. Woch.*, 1902, No. 49.) D. describes his apparatus, demonstrated before the Ophthalmological Congress at Heidelberg, 1902, which gives much better photographs than could be obtained before. The disturbing reflexes are excluded by using one-half of the pupil for illumination, the other half for photography. By exposing for 1/16 to 1/18 of a second instantaneous photographs can be made, which show the details of the fundus very well. Reproductions of photographic pictures of albuminuric retinitis and retinohorioiditis are given. D. is engaged in perfecting his apparatus still more with the co-operation of Zeiss and Jena.

Casuistics of Ectropium Operations.

BRUHL, A., Dermbach. (*Inaug. Dissert.*, Giessen, 1901.) In the period from April 1, 1890 to January 1, 1901, 295 cases of ectropium, out of 35,227 eye patients, were treated at the eye clinic at Giessen. Etiology: 199 cases were due to chronic inflammations of the lids and palpebral conjunctiva: 25 trachoma, 3 not fitting prothesis, 11 lacrimal troubles, 3 ichthyosis, 26 cicatrices, 1 eczema, 1 facial paralysis, 10 senile, 2 following erysipelas. 37 were operated upon by different methods (Snellen's sutures, Szymanowski, Fukala, Kuhnt-Müller) and are described in detail. It is of the greatest importance for the success of an ectropium operation to individualize according to form and etiology, and select the method adapted for the special case.

Casuistics of Intermittent Exophthalmus and Varicose Veins in the Region of the Eye.

CAUSE, F., Mainz. (*Inaug. Dissert.*, Giessen, 1902). The chief symptom of intermittent exophthalmus, which, so far, has only been observed unilaterally, is an abnormal mobility of the globe in antero-posterior direction which occurs under certain conditions, as in some positions of the body, in deep expiration and compression of the jugular veins, and is a consequence of the varying volume of the retrobulbar contents of the orbit, especially the orbital veins. C. collected the literature from 1897 on, and describes 2 cases from the university eye clinic of Giessen. Both cases are especially interesting since the affection almost disappeared under pressure, bandage and by avoiding any exertions, apt to increase the intravenous pressure of the head.

Causistics of Tumors of the Conjunctiva. Especially the Caruncle.

BLUM, D., Frankfort, A. M. (*Inaug. Diss.*, Giessen, 1902.) B. collected the cases of tumors of the caruncle and semi-lunar fold, so far published, and describes an adenoma of the caruncle in a woman, aged 51, a melanosarcoma of the caruncle in a middle-aged woman, a subconjunctival cysticercus at the temporal portion of the sclera in a boy, aged 8 years, and a case of tuberculosis of the conjunctiva and lacrimal sac in a girl, aged 14 years, from the eye clinic of Prof. Vossius. The latter case was interesting on account of the large polypoid tumors which relapsed four times after careful removals.

On Blenorrhic Conjunctivitis.

SPIEGELHOFF, J. H., Büthum. (*Inaug. Diss.*, Giessen, 1902.) S. reports on 80 cases of blenorrhea, out of 39,181 eye patients, treated at the eye clinic at Giessen, from April 1, 1890, to January 1, 1902, i. e., 0.204 per ct., ophthalmia neonatorum 0.15 per ct. 23.44 per ct. were lastingly damaged; excluding those that came with ulcerated or destroyed corneae to the clinic, only 5.4 per ct. The treatment consists in iced applications, frequent washings with oxycyanate of mercury or hypermanganate of potash and cauterization with 2 per ct. nitrate of silver or mitigated lapis. If an ulcer exists, the caustics are abandoned. Many cases healed under ice and irrigations with oxycyanate of

mercury without nitrate of silver. The results with protargol were not favorable, but this may be due to the minor strength (2.5 per ct.) of the solutions. A case of argyrosis was observed in a case of chronic trachoma which had been treated elsewhere with protargol.

Casuistics of Hereditary Retrobulbar Optic Neuritis.

HEINSBERGER, P., Bochum. (*Inaug. Diss.*, Giessen, 1902.) After describing this interesting affection, of which 307 cases, belonging to 81 different families, have been published. H. reports three new cases from two different families, observed at the eye clinic of Prof. Vossius. They were all men and the disease set in at the respective ages of 20, 27 and 21. Two older brothers of the first patient had the same trouble, while his youngest brother was not yet affected. The two other cases occurred also in brothers. In none of them was any deformity of the skull. Injections of strychnia are still mostly in favor, although they only increase the reaction of the nervous fibers.

A Case of Cerebral Tumor without Choked Disc.

ANNA, A., Klein-Rosseln, (*Inaug. Diss.*, Giessen, 1902.) Choked disc occurs on an average in 87.3 per cent. of cases of brain tumor. A. enumerates the theories as to its pathogenesis and the hypotheses, why it is not found in all cases. His case, observed at the psychiatric clinic of Prof. Sommer, belongs to the latter category and is reported in detail. The autopsy showed softening of the whole right frontal and temporal lobes, surrounded by gliomatous infiltrations. A. thinks that the softening of the tumor with formation of cavities by resorption of the softened material prevented an increase of intracranial pressure and thus did not cause papillitis.

On the Connection of Cataract with Goitre.

BECKER, A. Gonsenheim. (*Inaug. Diss.*, Giessen, 1902.) B. reports, from the eye clinic of Prof. Vossius, 8 cases of cataract (in 7 bilateral), occurring in women, affected with goitre, at a relatively youthful age. In his opinion the connection of cataract with goitre is perhaps due to autointoxication, analogous to the occurrence of cataract in affections of the thyroid or after extirpation of the latter (tetany, Graves' disease, myxedema).

A Case of Bilateral Mucocoele of the Ethmoidal Labyrinth.

FLATH. H. Offenbach. (*Inaug. Diss.*, Giessen, 1902.) Bilateral ethmoidal mucocoele, which is very rare, observed in a girl, aged 10, and removed by Prof. Vossius with good result is reported. F. collected 18 cases from literature in tabular form.

A New Electromagnet for the Extraction of Magnetic Foreign Bodies from the Eye.

SCHENKEL DR. PHIL. H., Bern. (*Deutsche Med. Woch.* 1902, No. 51.) In order to give the magnet various directions without changing the positions of the magnet or eye, S. constructed pole ends which move in ball and socket joints. He also made one tip curved, to avoid interference by the nose. The magnet is 55 cm. long, 90 mm. thick, surrounded by insulated copper wire of 3 mm. diameter. The construction is illustrated by drawings. It is manufactured by Max Kohl, Chemnitz, Saxony.

Sublamine and Its Toxic Action Compared With that of Corrosive Sublimate.

SCHUFTAN, DR. ADOLF. (*Inaug. Diss.*, Berlin, Aug. 15, 1902.) After reviewing the extensive literature on sublamine in hand sterilization, Schuftan expresses the belief that its use will be extended to other fields, such as to the treatment of syphilis. As its employment here will also be internal, subcutaneous, intramuscular and intravenous, it is of great importance to obtain an exact idea of the toxic action of the drug; and for this purpose at the suggestion of Prof. Liebreich, and with the assistance of Prof. Langgaard, he has made a series of experiments to determine the relative toxicity of sublamine and sublimate.

Twenty-one experiments with rabbits weighing from two to three pounds, gave the following lethal doses:

	Sublimate.	Sublamine.
By mouth	0.01 gram (1/6 grain)	0.4 gram (3/5 grain)
Subcutaneous	0.01 " (1/6 ")	0.1 " (1/6 ")
Intravenous	0.005 " (1/12 ")	0.0075 " (1/8 ")

By weight, therefore, sublamine administered per os or intravenously is less poisonous than corrosive sublimate, while subcutaneous it is equally so: Taking into consideration, however, the fact that 1.7 grams (25 1/2) grains of sublamine are equal in mercurial content to 1 gram (15

grains) of the bichloride, its poisonous effect subcutaneously is considered greater, and intravenously is somewhat greater than of sublimate.

The more vigorous action of sublamine when administered by the skin or the veins is most easily explained by its property of not coagulating albumin. Taken by mouth, this does not enter much into consideration; but by the other ways it causes a more rapid and ready absorption of the drug.

The author concludes by stating that the non-irritancy of sublamine may render it especially appropriate for syphilis, and that the painful infiltrations that occur may in this way be avoided.

Contribution to the Subject of Hand Disinfection.

FUETH, DR. H. (*Centralblatt für Gynäcol.*, Sept. 27, 1902), details the excellent results obtained from four series of animal experiments made with ethylenediamine citrate of mercury. The hands were infected with a virulent culture of tetragenus organisms (the method is given in detail), disinfected with soap spirit (by Mikulicz' process), and the skin scrapings administered to some guinea pigs by intraperitoneal injection: they all died from tetragenus infection, as did some control animals. The same process was employed previous to and after disinfection with mercury citrate ethylenediamine, but none of the animals developed tetragenus.

Investigations of the Action of Sublamine (Ethylenediamine-Sulphate of Mercury) as a Disinfectant.

BLUMBERG, DR. M. (*Münch. Med. Wochenschr.*, Sept. 16, 1902), describes in detail the experiments reported at last year's Surgical Congress in Berlin, and announces the results obtained from practical applications of sublamine.

He calls attention to the importance of selecting the mercurial salt having the greatest power of tissue penetration, which, as his experiments have demonstrated, is sublamine. Furthermore corrosive sublimate frequently causes eczemas of the skin; and exact experimentation has shown that the very slightest roughness, the most insignificant scaling of the skin, make an efficient redisinfection more and more difficult. As Schleich, Gottstein, Haegler and others have insisted, a good condition of the hands is the first desideratum for efficient sterilization; and

sublamine, even in very concentrated solutions, in which sublimate cannot be employed at all, does not attack the skin.

Hereditary or Family Optic Nerve Atrophy.

LAUBER, DR. HANS. (*Münch. Med. Wochenschrift*, December 9, 1902.) Lauber relates the histories of four brothers all of whom were subjects of atrophy of the optic nerve. The trouble commences usually at puberty, though it has been observed as early as the fifth year. It generally appears under the garb of a retrobulbar neuritis and rarely do we notice any swelling of the papilla. It is seldom acute and generally in a year it has run its course. Generally one eye after the other is attacked and usually some vision remains. Central scotoma is often present. The periphery of the visual field can remain normal. Therapy is fruitless. Males of the family are more prone to the affection than the females. The etiology is very obscure. Instances are recorded where the trouble showed itself in five generations. Possibly intermarriages among relations may be a factor.

The Influence of the Cervical Sympathetic upon the Eye.

LEVINSOHN, DR. GEORGE, Berlin. (*Archiv. für Ophthalmologie*, LV. Band, I. Heft.) The author's experiments were made on monkeys and consisted in removing the superior cervical ganglion and also in simple resection of the cervical sympathetic. The question was whether the usual symptoms seen after the operations in this locality are more significant when the ganglion is removed or when simply the cervical sympathetic is resected, and secondly when factors are at work in the disappearance of the symptom-complex. He found that both after extirpation of the ganglion and resection of the sympathetic different trains of symptoms resulted, which in time in great measure disappeared. The symptoms produced by extirpation of the ganglion were more intense than after resection of the sympathetic, still the recession in the first instance is much less intense than in the latter. But even after extirpation of the ganglion some of the resulting symptoms remained, which shows that the normal tone of the straight muscles supplied by the cervical sympathetic has been injured and at the same time there is a compensating lowering of tone in their antagonists. This

lowering of tone for the dilator pupillæ and sphincter is proven beyond a doubt.

Tuberculous Panophthalmitis in the Puerpural State.

LUTTGE, W. (*Archiv für Ophthalmologie*, LV Band. I. Heft.) The case reported by Luttge was that of a woman who had borne four children and who four years previously had suffered with a tuberculous affection of the joints and glands but who otherwise had been quite well. The labor had passed off uneventfully and on the seventh day afterward she had a slight chill and fever and two days later inflammation started up in the right eye leading to complete blindness in three weeks. Six weeks later perforation occurred and enucleation was found necessary. The anatomical and bacteriological examination showed undoubted tuberculous panophthalmitis. The patient seen after this suffered with headache and vertigo and she stopped menstruating. A few months later she died of meningitis.

Preliminary Communication Upon the Action of Methyl-Atropine-Bromide.

LUDWIG, DR., Vaubel. (*Wochenschrift für Therapie und Hygiene des Auges.*, October, 1902.) The author has been making very recently experiments with some of the derivatives of atropine and he calls attention especially to one mentioned above. He notes that the action of this product is not only shorter but milder than that of atropine. Its action upon the vagus is much feebler than that of the latter, and the period of excitation comes on much later than it does in the case of atropine and therefore it would seem to be a somewhat safer remedy for use in the eye.

The Large Magnet in the Extraction of Particles of Iron from the Eye.

HAAB, PROF. (*Zeitschrift für Augenheilkunde*, December, 1902.) Haab gives us an interesting analysis of the one hundred and sixty-five cases upon which he has operated with the large magnet. He lays down the rule that in all cases where the location of the foreign body is unknown that the point of the magnet should be brought exactly opposite the middle of the cornea for in this way one avoids dragging the piece of iron through the ciliary body. Where the piece of steel is firmly imbedded in the posterior part of the eye he opens and closes the current

alternately for fifteen or twenty minutes hoping in this way to dislodge it. In the one hundred and sixty-five cases one hundred and forty one were successful that is to say the foreign body was extracted. In one hundred and thirty-four particularly difficult cases in which the particle of iron had passed behind the iris and lens the foreign body was extracted in one hundred and eleven cases and in thirty-four of these cases the particle of iron was apparently imbedded in the retina. The failures were due first to the fact that the foreign body was imbedded too firmly in the back of the retina or in the ciliary body or where the particle was completely covered with a fibrinous exudate and this was especially the case where the body was a chip from a pick-ax. Finally failure was met with, when so-called encapsulation of the foreign body had occurred. In thirty-nine cases out of the one hundred and sixty-five, enucleation was subsequently found necessary. Of the total number operated upon fifty-five obtained useful vision, and twenty-one can still further be benefitted by operations. Reckoning the three last groups seventy-nine in all upon the basis of one hundred and forty-one from which pieces of steel were removed fifty-six per cent. obtained useful sight. The chief advantage of his method is that it does not injure the vitreous. He thinks both the sideroscope and the X-rays superfluous.

Pathological Anatomy of Albuminuric Retinitis.

KOPPEN, ALFRED. (*Zeitschr. für Augenheilkunde*, December, 1902.) The author first gives a comprehensive review of the work which has been done by others in this connection and then describes in detail the anatomical changes which he found in two cases of albuminuric retinitis. He is particularly concerned in the explanation of the star-shaped figure in the macular region. He is of the opinion that changes in the bloodvessels and disturbances in the circulation underlie the anatomical changes in this form of retinitis. He does not think that the star figure is due to degenerative changes going on in the radiating fibres, but we have rather pathological anatomical foci between the radiating fibres which are to be regarded as the terminal events in the history of a chronic inflammatory change in the retinal circulation, and the

little patches represent exudates and old hemorrhages and their peculiar position between the radiating fibres and the typical course of the bloodvessels in the macular region cause the characteristic figure. The hemorrhages can take place in any retinal layer in which bloodvessels are present. That part of the retina between the granular layers is according to Koppen peculiarly predisposed to hemorrhages because in this location very fine capillaries are to be found and it is in these capillaries that the first changes are to be seen.

Subconjunctival Injections of Hetol.

LEZENIUS, DR., St. Petersburg. (*Monatsblaetter für Augenheilk.* October, 1902.) The author uses generally either a one or five per cent. solution of hetol in water or salt solution. The solution must always be clear and have always either a neutral or slightly alkaline reaction. Acid solutions are to be rejected. After two or three days treatment the irritative symptoms of herpes cornea practically disappear. It has a marked effect upon the pain. The herpetic ulcers rapidly become clear and generally speaking the cure was effected in ten days, and several times in less. No constitutional treatment was used. In ulcers of the cornea, particularly of the atonic variety, the method is valuable in transforming them into a more active and acute form, which condition is preliminary to healing. In perforating and non-perforating ulcers the injections had a most happy effect in quieting pain. In cases of interstitial keratitis the effect of the injection is simply to shorten what we know is usually a chronic affair. Of course in all these cases constitutional treatment and atropine were employed. The treatment seems to have no effect upon pannus. In iritis and chorioiditis where the disease was not purulent in character the injections were found innocuous and in a number of cases it seemed to be absolutely useful. In diseases of the sclera it seemed to have a shortening effect upon the process. Its action is probably due to its diffusing into the lymph vessels of the conjunctiva and from thence into the corneal lymphatic spaces. It seems to exert its principal action upon the cornea and its surroundings, and the further away the point of the injection the less efficacious it is.

Bandages.

GENTH, DR. (*Archiv. für Augenheilkunde*, Bd. 46, S. 135.) The author has shown quite conclusively that bandages infected with micrococcus lanceolatus and staphylococcus pyogenes aureus rarely led to infection of wounds, which have been produced in the cornea and sclera of rabbits experimentally. The asepsis of the bandage is far less important than aseptic instruments. He takes occasion then to enter a plea for the Fuchs shield, which should cover a borated lappel secured in place by strips of adhesive.

The Treatment of Tuberculous Iritis with Tuberculin.

HANDMANN, DR. M., Hanover. (*Klinische Monatsblätter für Augenheilk.* October, 1902.) It may be remembered that two years ago Shieck published a communication bearing upon this subject. He analyzed all the cases recorded up to that time. All the cases treated with tuberculin, even the worst forms, got well. There was no danger of the bacilli migrating to other parts by the use of this method. Handmann has recently had an opportunity of testing the question and he reports two cases in which tuberculous iritis was treated with injections of tuberculin. He commences with injections of 1/1000 mg. and goes up to as much as 3,0 mgr. and gives in all thirty-one injections. The injections were given every other day and generally in the forearm. In both cases the cure was complete and permanent.

Metastatic Conjunctivitis of Gonorrheal Origin.

KURKA, DR. ANTON. (*Wiener Klinischer Wochenschrift*, 1902, No. 40.) The author reports two cases. The condition was characterized by a deep episcleral injection marked swelling and secretion. Both cases were complicated with irido-cyclitis and one case with polyarthrititis. Bacterological examination showed gonococci and also bacilli identical with the influenza organism. The treatment consisted in touching with nitrate of silver and in the usual treatment for iritis.

Protargol.

VON RUPPEL, DR. (*Die Ophthalmologische Klinik.*, September, 1901.) Von Ruppel has used the well-known remedy in over eight hundred cases in the polyclinic in Stuttgart. In all conjunctival affections characterized

by much secretion it is by far the most effectual remedy. Using protargol once daily he found that the average time to effect a cure was fourteen days. It is valuable in dacriocystitis, at the same time some massage of the tear sac should be employed whenever the protargol is instilled. In cases of blenorrhea, particularly of the fulminating variety, Von Ruppel still used the nitrate of silver, but in ordinary cases he found that the protargol was all that was necessary. Argyrosis was never seen. He thinks that its advantages over nitrate of silver lie in its relatively less irritating properties and in its apparently greater powers of penetration. It differs especially from nitrate of silver in that unlike the latter it is not caustic.

Magnet Operations.

MAYWEG, W. (*Klinische Monatsblätter für Angeheilk.* July, 1902.) In the last ten years Mayweg has operated ninety-two times with the magnet, and of these, twenty cases were where the piece of iron remained in the anterior segment of the eye and did not penetrate the posterior capsule. In all the other cases the particle of iron had its seat in the posterior segment of the eyeball either in the vitreous body, the retina, chorioid or sclera, or maybe after passing through the eyeball in the orbit. In the seventy-two cases in which the iron was removed from the interior of the eye, forty-two times it was brought out through the channel of entrance in the sclera and twenty-five times it was brought into the anterior chamber after Haab's method and from this point extracted. Among the forty-seven cases the vision was absolutely lost in eleven cases and in seven of these either enucleation or exenteration was found necessary while in the remaining twenty-nine cases the vision was to a more or less degree preserved. In the twenty-five cases in which the foreign body was brought into the anterior chamber and extracted vision was lost in fourteen cases and twice enucleation was found necessary.

Vaseline Injections.

TOPOLANSKI, DR., (*Weiner Med. Wochenschrift*, 1902.) The author has operated upon twenty-five cases according to the method of Germany in cicatricial retractions of the lower orbital border, after caries, ectropion, partial trichiasis and scars from burns of the upper lids. The results

were unusually favorable, and the only disfigurement was slight bulging at the site of the injection.

The Clearing up of Old and Recent Corneal Cloudings by Means of Dionin.

VON ARLT DR. (*Wochenichrift für Therapie und Hygiene des Auges.*, No. II, 1902.) The author has treated at least twenty cases of corneal clouding with applications of dionin and by far the greater number were benefited but in only five cases was he able to follow the complete history through. Four of these cases were children with marked corneal cloudings and the fifth case was a man twenty-seven years old.

Von Arlt is in the habit of applying the dionin once a week, seldom as often as twice a week and never more than 0.005 at a time which he puts into the conjunctival sac and rubs in well. When the patient or some member of the family is entrusted with the treatment he employs a ten per cent. salve with lanolin which he rubs in once weekly. The treatment of course extends over a considerable length of time. The first patient was treated sixteen months, the second eighteen months, the third fifteen months the fourth twenty-one months and the fifth patient three months. In all these cases the results were startling; vision in several of the cases being brought up to the normal.

Epiphora After Removal of Tear Sac.

SCHIRMER, O. (Minutes of the Heidelberg Ophthalmological Congress, August, 1902. *Die Ophthalmologische Klinik*, September 5, '02.) Schirmer removed the tear sac in fifty cases and five years later on questioning the patients found that in by far the majority of the cases the eye did not water while the patient was in the house but as soon as the patient was exposed to the slightest wind the lacrimation appeared. Only half of the patients reported improvement from the operation. The improvement can not be attributed to atrophy of the lacrimal gland as has been shown by Schwarz to be the case in rabbits. Schirmer thinks that when epiphora persists after extirpation of the lacrimal sac that it is due either to conjunctivitis or entropion and if the proper treatment for these conditions does not relieve he advises removal of the lacrimal gland.

Liver Preparations and Hemeralopia.

BYLSMA, DR. R. (*Wochenschrift für Therapie und Hygiene des Auges*, October 16, 1902.) Bylsma calls attention to the fact that in the days of Hippocrates it was the custom to treat some eye affections with liver preparations and recently Kubli of St. Petersburg reports cases of hemeralopia which he successfully treated in the same way. Similar observations are recorded by Frantes. The following cases were reported by Bylsma. The first patient was a boy of sixteen whose vision was perfect during the day but who after sundown was absolutely unable to see how to move about on the street and who could neither read or write by lamp light. The trouble came on suddenly and had been present about six weeks. Examination revealed a slight amount of hyperopia and normal vision with perfect visual field. Two hundred and fifty grammes of baked mutton liver were given him daily and in two days his hemeralopia had entirely disappeared. The cure was permanent. Another boy of fifteen with hemeralopia was treated in the same way and with the same result, the hemeralopia disappearing after five days treatment. In this case the trouble came on suddenly and without apparent cause and had been present four weeks when treatment was instituted.

A Case of One Sided Transient Exophthalmos.

RUTTER, DR. (*Die Ophthalmologische Klinik*, November 20, 1902.) Rutter reports the case of a lamplighter who presented himself with an extensive edema of both lids of the left eye. This swelling extended over the upper lip and cheek on that side. The swelling disappeared in four days and left a pronounced exophthalmos. The vision was normal so also the visual field. The protrusion of the eyeball was so pronounced that it was impossible to close the lids. There was no injection of the eyeball and the latter was movable. The pupil was widely dilated and reacted to light. The vision at this time was much diminished and the field somewhat narrowed. The protrusion increased and the movability of the eye became somewhat impaired. There was also some swelling of the preauricular glands and also of the submaxillary glands. He was put on mercurial inunctions and iodide of potash. Three weeks later the vision had considerably improved

and the exophthalmos had receded. The author discusses the possible etiology of the exophthalmos as for instance tumors, orbital phlebitis, etc., and he excludes all these as being in any way concerned. The age of the patient, the anemia, the irritability, the rigid recession, all these symptoms speak for Basedow's Disease.

Atrabilin and Dionin In the Treatment of Glaucoma.

WOLFFBERG, DR. (*Wochenschrift für Therapie und Hygiene des Auges*, January 8th, 1903.) Wolffberg's advocacy of these drugs is well known. He is in favor of using dionin in these cases of hemorrhagic glaucoma where the pain is excessive and we hesitate to operate. Here the dionin helps the action of the eserine and acts also as an analgesic. In acute glaucoma without hemorrhagic tendencies atrabilin is valuable in that it helps the action of the eserine.

The Treatment of Myopia.

LIEBRIECH, R. (*Klinische Monatsblätter für Augenheilkunde*, November, 1902, S. 289.) What we want to do is to regulate the relation between convergence and accommodation and we can only bring about the proper conditions by either making convergence easier with the aid of prisms or aid accommodation with concave glasses. In the earlier stages of myopia Liebrich orders prisms as soon as the child learns to read. He seems to think that prisms alone can prevent the progress of myopia in its early stage. He holds that the full correction of myopia is inadmissible, that is to say generally speaking.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

CASEY A. WOOD, M. D.,

CHICAGO.

(Quarter Ending December 31, 1902.)

What Precautions Shall We Take in Operating on Cataract in the Presence of Dacriocystitis?

ANGELUCCI (*Archivo di Ottamologia*, , Anns. X. Fase. 1-2, pp. 79-84, 1902) believes that dacriocystitis constitutes an absolute contra - indication to the extraction of cataract. On account of the advanced age of some subjects and the length of time required for a cure of the dacriocystitic process, it is important to adopt some treatment which shall not only be effective, but that shall bring about a rapid cure. He employs the following method in these cases: 1. In simple lacrimal stenosis ordinarily situated at the bottom of the lacrimal sac, where he does not wish to run any risk of post-operative infection, however remote he makes an incision with a small bistoury transversely through the entire thickness of the lid (including of course the tissues of the upper and lower canaliculi) one millimetre and a half to two millimetres distant from the lacrimal puncta. At the same time, with the galvano-cautery, he touches the edges of the wound, thus insuring closure. After two weeks the cataract operation can be carried out without any danger whatever.

2. In cases of dacriocystitis his advice varies according as the disease is complicated or not by tumor of the perilacrima. A perilacrima tumor is, as is well known, a sort of diverticulum of the true lacrimal tumor, and bears the same relation to the enlarged sac that a urinary abscess does to the inflamed and ulcerated urethral mucous membrane behind a stricture. In addition

to shutting off the canaliculi, where we have to deal with lacrimal tumor, without pericystic swelling, he introduces a sound through the upper lacrimal orifice, then forcibly dilates the stricture. For this purpose he uses divulsors which are simply the ordinary canulas of Wecker in which the outer sheath is about 4 cm. longer than the sound, so that after its introduction it readily passes into the lacrimal sac, and then into the nasal duct. If previously the punctum has been dilated with a large conical sound, or incised a millimetre or two, and if there be injected subcutaneously over the lacrimal sac from 6 to 8 drops of 4 per cent. cocaine solution, the operation is not only easy of execution but gives no pain. Through the same sound, when it is raised and partially withdrawn, there should be injected into the nose a 1 per cent. solution of protargol. On the following day the same manoeuvre is to be repeated with sound No. 2, and on the third day with No. 3. After ten to twelve days of such treatment, if it be not satisfactory or a sufficiently large sound cannot otherwise be used the canals are incised and probed in the usual way.

Where the dacriocystitis is complicated by perilacrimal tumor, a condition common in some ectasiae. Angelucci incises the tumor, scrapes the cavity with a curette, and tampons it with a roll of gauze wet with equal parts of tr. of iodine and glycerine. Two or three days later through the skin incision he places in the nasal canal a permanent style, at the same time slitting and probing the canaliculi. Each day until complete healing occurs he removes the style and swabs out the bottom of the cystic cavity until it closes; after this he dispenses with the style altogether, secure of the rapid closure of the incision.

After this treatment the post-operative course of the cataract operation is pretty sure to proceed, as usual, without incident. At the same time he has observed, about the third day after operation, a slight return of swelling in the region of the sac; the conjunctiva became red and the iris congested, but the use of atropine and of endovenous injections of sublimate easily overcame this complication.

In bad cases, where the bones are necrosed, as a further precaution, the writer injects subcutaneously, at the time

of the cataract operation, 20 cc. of antistreptococcic serum. He repeats the injection on the following two days, and believes that in this way he has been able to prevent serious complications.

Angelucci believes that this is the best of the methods to be employed in these cases of complicated cataract. They do not prevent the secretions of the sac from passing into the nose; these form a barrier to the regurgitation of muco-pus into the conjunctival sac; and they may even re-establish the passage of the tears into the natural channels. The permeability of the lacrimal passages by the secretions of the conjunctiva may be brought about in the case of the cautery closure of the canaliculus wound by making a little transverse button-hole behind the artificially produced stenosis. When the lacrimal passages are not easily permeable, probing, or the introduction of a Scarpa's style, remaining in the passages for two or three months, definitely puts an end to these inconveniences.

When incipient cataract is complicated with dacriocystitis, Angelucci has recourse to the ordinary methods used for the treatment of the lacrimal passages, as the element of time does not, as a rule, enter into consideration.

[In cases of cataract complicated with mucocele or lacrimal stenosis in which the canaliculi are intact and there is no pericystic infection. The editor would strongly advise the method suggested and employed by Buller. The whole lacrimal tract is first thoroughly cleaned out and disinfected (especially with formaline solutions and Nuel's syringe) and the conjunctival surfaces made as nearly aseptic as possible. A No. 2 black silk suture is then passed through each lid margin in such a manner as to include the canaliculi, 2 mm., behind each puncture. The sutures are then tied, not too tightly, but firmly enough to prevent regurgitation from the infected sac and duct. In a case of mucocele, with a constant regurgitation of pus from the lacrimal into the conjunctival sac, the editor removed a cataract a month ago. The healing of the corneal wound was entirely normal, and the case has done well. On removing the sutures, eight days after the cataract operation, some of the 20 per cent. argyrol solution (used for injection into the sac) mixed with a muco-pus

flowed from both puncta showing that the constriction of the sutures had not produced organic strictures at the site of the knots but that the morbid secretions had remained within the sac, canaliculi and nasal duct. The stenosis was afterward shown to be complete, and to be situated in the lower third of the nasal canal. The thread ends had been cut off close to the palpebral skin and the knots had not irritated the globe.

Buller's procedure is certainly preferable to that of Angelucci and better than sealing the puncta with the galvanic or other cautery, because of its simplicity, its effectiveness, and because it does not sacrifice the puncta or canaliculi. It is particularly advisable in those cases of lacrimal stenosis where the obstruction is chiefly due to swelling of the mucous lining of the duct, or to disease of the nose. In these cases we may hope by injecting (and perhaps probing) the passages through the puncta, and by treatment of the nasal complications to cure the case without destroying the canaliculi and the punctal suction apparatus.—C. A. W.]

Case of Recurrent Ophthalmoplegia of the Third Nerve.

G. PETELLA (*Analli di Medicina Navale*, April, 1902) reviews ten cases of oculomotor paresis that have been published in Italy and describes another case observed at the clinic at Turin. The patient was a woman of 38, free from any neuropathic heredity which might stand as a predisposing factor. She had suffered for twenty years from nervous symptoms directly connected with the sexual functions. Some of these had been localized in the right orbito-frontal region (pains, photophobia, cutaneous hyperemia, etc.). The paralysis of the third, fourth and sixth pairs had appeared shortly before she was first seen. The paralysis was of brief duration and coincided with the instantaneous cessation of all other suffering. Three other paralytic attacks recurred in the course of a month and a half, each one rapidly subsiding with a complete return to the normal condition. The appearance of the menses had an evident influence on the first and fourth attacks. The paralytic accidents then subsided completely for three years while other disturbances, especially cephalalgia and vomiting, persisted, rendering the prognosis puzzling. Petella is inclined to

explain the vertigo, headache and vomiting from which the patient still suffers, as symptoms of recurring cerebral congestion. These disturbances in the circulation affect the meninges and thence the nuclear center of the motor oculi nerve. He therefore accepts Mingazzini's assumption of a neuritis of the radial fibers of the third pair.

Note on the Pathogenesis of Trachoma

NICOLA (*Annali di Ottalmologia*, 31, fase 3-5, p. 247) gives the details of 9 cases personally observed and remarks that the findings were practically the same in 20 others. He also reviews the literature on the subject and draws the conclusion that the anatomopathologic changes in trachoma are not directly due to any specific infection. They are rather the result of a special reaction on the part of the lymphoid stratum of the conjunctiva to any of the ordinary causal factors of conjunctivitis, promising favorable circumstances and a predisposition on the part of the individual subject. This view may seem untenable at first glance, but it is sustained by the fact, which certainly cannot escape the observation of those who, for example, have studied an epidemic of conjunctivitis caused by the Koch-Weeks bacillus, certain members of an infected family recover rapidly, under simple medication and with not a trace of their infection, while in others the affection displays a tenacity and resistance to the most varied and most vigorous methods of treatment, finally assuming a chronic course and terminating in the lesions characteristic of a true trachoma.

The Milder Forms of Iridic Tuberculosis.

CALDEBARO (*Clinica Oculistica*, July, 1902) asserts that tuberculosis of the iris is, in 85 per cent. of all cases, secondary to other tubercular lesions of the organism. Only in 15 per cent. of the cases is it due to a primary infection in the iris, the bacilli having penetrated through the corneo-conjunctival surface. It occurs in two different forms, one very serious which entails the loss of the eye, and the other, the so-called attenuated infection, which is capable of spontaneous cure. There are no characteristics, clinical, anatomic nor experimental, which enable us to differentiate these two varieties. The course of the affection alone is the only criterion for the diagnosis. Tuberculosis of the iris

may appear in three different clinical manifestations, miliary, conglomerate and infiltrated. The attenuated form usually assumes the miliary aspect. The prognosis is always grave for the eye and should be guarded in respect to the individual. Death occurs in 50 per cent. of the cases in which the ultimate results are known. The prognosis *quoad vitam* is improved by enucleation. Treatment should be expectant so long as there exists a possibility of preserving some degree of visual acuity or at least we should attempt to preserve the eyeball for esthetic reasons. The attenuation of the tubercular affection in the iris is not due to a diminished resistance on the part of the specific bacillus, but on the local conditions of organic resistance.

Treatment of Infantile Glaucoma.

SPATARO (*Clinica Oculistica* for June, 1902 — From the *Bollettino d'Oculistica*, XXI 15) believes that surgical measures are the only effective means of treating the hydrophthalmus of infancy. All operations should include the incision of the iris angle according to De Vincentiis' method. In certain cases (of the inflammatory form), it is advisable to clear the cornea by repeated paracentesis. After the operation a 3 per cent. solution of pilocarpin should be instilled four times a day for two weeks and then twice a day for the same length of time. The operation should be supplemented by general tonic measures and with the iodides, in other words not even the operation does not promise a radical cure in all cases.

Case of Death from Wound of the Orbit.

CAPELLINI, C. (*Bollettino d'Oculistica* XXI, 17.— Reviewed from the *Rend. dell' Assoc. Med. Chir. di Parma*), relates the history of a five-year old boy who was struck in the left eye with a stick. The day following the accident there was edema of the lids with cutaneous ecchymosis congestion of the conjunctiva and excessive secretion. The eyeball was apparently sound, and all attempts to discover a foreign body were fruitless. On the sixteenth day a tumefaction had developed beneath the orbital arch near the inner angle, corresponding to a granuloma in the conjunctival folds. It was incised and a few prices of straw were extracted. The local lesion

progressed favorably for six days when suddenly the little patient had a brief syncope. Three days latter the temperature rose rapidly to 41 C., with unconsciousness, with attacks of convulsions alternating with drowsiness and fits of screaming. Death followed five hours after the onset of these symptoms. Diffuse purulent meningitis was revealed by the autopsy, and a splinter of wood, 1 cm. long and 36 mm. wide, was discovered which had perforated the vault of the orbit in its inner portion and had buried itself in the brain substance, causing an abscess which had broken into the third ventricle. The infectious element was represented by the streptococcus pyogenes in pure cultures. Capellini points out that in this case, aside from the conjunctival lesions, there were no signs nor symptoms for quite a long time which would suggest the possibility of serious cerebral lesions.

A Contribution to the Clinical Study of Trachoma.

C. BELLIZONA (*Bolletina della Societa Med.—Chir. di Pavia*, 1902) distinguishes between follicular conjunctivitis and trachoma and has collected important statistics in regard to the latter. They indicate that the female sex is more subject to trachoma than the male, and adults more than the very young or the very old. The season has very little influence on the course of the disease, although, as he remarks, it is difficult to form an opinion on this matter as patients do not apply to the physician until the evil is far advanced. He gives a chart of the geographical distribution of trachoma in the province of Pavia. He made a special study of the complications of trachoma and found that the most frequent was inward curvature of the tarsus and more or less extensive cicatrices on the conjunctiva. Symblepharon was rare, occurring in only 6 cases, xerosis in 4, pterygium in 30. The cornea was affected in 65 per cent. Pannus was pre-eminent among the disturbances in vision caused by invasion of the cornea. The lacrimal passages were very rarely involved. He concludes his communication with advice as to prophylactic measures against this terrible affection.

ABSTRACTS FROM JAPANESE OPHTHALMIC LITERATURE.

BY

DR. MITSUYASU INOUE.

TOKIO, JAPAN.

TRANSLATED FROM GERMAN MS. BY NELSON M. BLACK, M. D.

MILWAUKEE, WIS.

(Quarter ending December 31, 1902.)

The Ophthalmo-Therapeutic Importance of Dionin.

NIMI, DR. According to the author dionin is one of the chief remedies in the ophthalmologic therapy and has proved itself especially good in:

(a) Pannus trachomatosus vasculosus.

(b) Keratitis parenchymatosa, especially in the rapidly destructive variety and where atropine does not produce sufficient mydriasis.

(c) In iritis.

The author reports a case where the brilliant effect of dionin could not be denied:

A 34 year old woman consulted him with pannus trachomatosus vasculosus totalis of both eyes, with vision only movements of the hand. After about ten days unsuccessful treatment by various methods, a 4 per cent. dionin solution was instilled five times daily in the eyes, on the day following the first application, the vision increased to such an extent that the patient was enabled to recognize for the first time a person sitting directly opposite. Corresponding with this objectively, noticeable contraction of the newly formed vessels and the clearing up of the opacity was observed. After one week a 10 per cent. solution of copper was used in penciling, in connection with the dionin which was instilled three times daily, and he dismissed the patient six weeks later with vision of 20/CC.

Central Scotoma in Beri-Beri.

AOKI, DR. Since T. Kono, of Tokio, in 1895, discovered a negative central scotoma in those ill with beri-beri complaining of poor vision, which Mitsiyasu Inouye found due to retrobulbar neuritis; the occurrence of this eye lesion in beri-beri has become generally known in Japan. J. Komoto calls attention to the fact that the symptoms of the beri-beri retrobulbar neuritis are absolutely the same as those caused by alcohol and tobacco, therefore, he looks upon beri-beri as an intoxication sickness. The author reports a case as follows:

(a) The eye symptoms made their appearance before any signs of the disease were manifest on the body.

(b) White and color scotomata were nearly all obliquely oval, the size of the latter diminishing in the following succession: green, red and blue.

(c) In changing from the rice diet to the "azuki" diet (azuki is a sort of bean—*phaseolus radiatus*) the scotomata diminished visibly; and increased on returning to rice diet.

The conclusion is, from the observed improvement under the "azuki" diet that beri-beri probably under certain conditions stands in etiological connection with the rice diet.

A Case of Gumma of the Iris with Central Punctate Retinitis.

KOMOTO, DR. A syphilitic aged 37 received a blow on the left eye the sight of which was already impaired by the disease; this caused great pain followed by blindness; the condition in two months was: Injected conjunctiva, cloudy cornea, occlusion of pupil and slight hyphemia, intraocular pressure increased, a round gray swelling closed the pupil. Macroscopic and microscopic examinations of the enucleated eye showed the swelling started from the iris and was composed of round cells with deep staining nuclei; the disc showed a glaucomatous excavation; at the macula numerous gray spots were found and in the slides taken from this neighborhood is an interwoven fibrous-like tissue with no round cells between the retina and chorioid. Incidentally the author cites a case of chorioidal gumma occurring in the right eye of a 35 year old syphilitic. After the clearing up of the cloudy vitreous by antisymphilitic treatment, a gray elevation was

seen at the upper inner portion of the papilla which disappeared finally under a continuation of the treatment leaving a gray spot.

A Case of Vaccine Ophthalmia.

KIKUTSI, DR. The case is particularly markworthy because of its strange origin. A Chinese doctor vaccinated a birth mark on the upper lid of a two year old boy thinking thereby to remove the same; the following morning the lid was so swollen, the eye could not be opened; there was also slight redness of conjunctiva; in a few days a pustule formed on the naevus, with increase in the conjunctival hyperemia which became chemotic, with a first serous then sero-purulent secretion; the tarsal conjunctiva showed a yellowish membrane closely adhering to the underlying tissue; in the cornea was noticed a superficial infiltration at times, which disappeared without leaving any change in structure. The condition lasted about two weeks during which time there was a fever of about 38° C. The naevus disappeared leaving a scar which was the "Quacksalbers" idea in the treatment, but a proceeding most dangerous to the eye.

Lid Gangrene.

MORI, DR. and RIKUJI YAMAMOTO, DR. In a poorly nourished month and a half old infant was seen a triangular defect at the right outer canthus $1\frac{1}{2} \times 1$ cm. the apex toward the temple. The base of the ulcer penetrated to the orbital wall and was covered with a dirty yellowish odorless pus and bled easily, while the surrounding tissue was dirty gray, with the edges sharply marked, the surrounding skin is a dark blue color with slight hyperemia and swelling. There is total ectropion of the upper lid, the conjunctival surface of which is covered with a yellowish crust; the under lid seems normal; the lids are held together at the outer canthus by a narrow bridge of skin; cornea normal. The mucous membranes appear intact; also on the body and in the internal organs nothing abnormal can be found, excepting a small loss of tissue on the back of the left ear.

According to the mother, soon after birth, a red excoriated place was seen at the right outer canthus, which on being examined by a doctor 10 days before was torn a

little and then gradually increased until it reached its present size. Bacteriological examination showed diphtheria bacilli to be the cause of the ulcer of the eye and also of the spot behind the ear. In dressing the ulcer, the lower lid, while it appeared normal, was found gangrenous; the fever varied from 38° to 39.3° C. Although the cornea became hazy, the ulcer decreased slowly and after one injection of Behring's serum, the temperature returned to normal. The patient did not return for ten days when the ulcer was greatly enlarged and the general condition of the child much worse. Another injection of serum produced no improvement and finally the child died.

Central Scotoma in Beri-Beri

YUITSU YAMAMOTO, DR. According to the author, central scotomata in beri-beri are found in three conditions, i. e., (1) in a negative condition of the fundus, (2) in partial temporal atrophy of the papilla, and (3) in symmetrical atrophy of the papilla. The following case belongs to the second classification:

A 21 year old farmer had beri-beri when 14 years of age which was cured in a few weeks. The winter preceding his being seen, he had a return of the disease, with fever chills and headache followed in a few days by the more severe symptoms of the disease, edema and parasthesia of the face, the trunk and lower extremities, hoarseness, dysphasia, dyspnoea, anorexia and constipation. During the improvement of the general symptoms the patient suddenly noticed a dimming of vision, which has since remained unchanged. Examination showed V. O. D., 20/CC; V. O. S., = Finger in 10 M. Square-oval, positive, central scotoma; defect in the color scotoma came in the following order as to size, green, red, and blue. The papilla on both sides showed atrophy of the macular bundle. The rice diet was replaced by the "azuki" diet and with barley and its preparations and a cathartic given. This treatment influenced the disease favorably so that the general symptoms disappeared except the parasthesia of the feet below the ankles; the vision increased to 20/L and 20/LX respectively.

Clinical Observation in Retinitis Cachecticorum from Carcinomata Ventriculi.

MIZNO, DR. The same patient in whom Dr. Nakaizumi

had already discovered a filaria in the vitreous (*Annals Ophth.*, July, 1902, page 576) was received in April the same year into the University Clinic with symptoms of cancer of the pylorus. The author frequently examined the patient who was 56 years old and very anemic and emaciated. At the end of May the eyes showed no fundus changes like those described by Nakaizumi and he had a vision of 20/XX with correction. A week before his death, the last of June, patient complained of failing vision; the cause could not be determined because of the serious condition of the patient; but two hours before his death the author succeeded, by means of artificial mydriasis, in making a thorough ophthalmoscopic examination which showed in both eyes, media clear, fundus very anemic, papilla pale but sharply outlined, vessels contracted. Surrounding the papilla were numerous gray, indistinctly defined plaques, whose form and size were greatly varied, the most being along the vessel branches, some of which are nearly covered by them. At the macula of the left eye a small hemorrhage was seen. These retinal changes undoubtedly caused the failure of vision of which the patient complained two weeks prior his death.

The urine was free from albumen and sugar.

This case coincides entirely with that reported by Pick. The results of the histologic examination of the enucleated eye will be published shortly by Nakaizumi.

Pannus Totalis Healed by Inoculation with Blennorrheal Secretion.

KOMOTO, PROF., and ARAKAWA, DR. The author inoculated a 19-year-old woman suffering from pannus totalis of right eye with a blennorrheal secretion containing gonococci. Vision of right eye before inoculation was only light perception; conjunctiva slightly injected, also slight secretion, granulation tissue especially at fornices cornea completely covered with pannus. Two days after the inoculation the blennorrheal symptoms showed themselves and the opacity of the cornea increased, this condition also appeared in the untouched left eye which had vision equal to counting fingers at 1 foot. Both eyes secreted a gonococci containing pus. On the 16th day the inflammation diminished; after five weeks the pannus was so much

improved that with each eye vision was equal to fingers at eight feet. During the entire course of the inflammation the eye was treated with silver and other remedies; two months after the inoculation the patient was dismissed. Tarsal conjunctiva entirely smooth and more anemic than normal: no granules: cornea with few vessels and diffuse delicate opacities; secretion greatly lessened, V. O. D. = 20/C; V. O. S., 20/CC.

Rare Eye Symptoms in a Case of Hysteria.

OGUTSI, DR. The case is of interest because of the combination of two newly discovered eye symptoms with hysteria, i. e., the tubular visual fields, which Greeff first described (*Berliner Klinische Wochenschrift*, May, 1902) and the "converging stars" described first by Königshöfer (*Ophth. Klinik*, April, 1902).

An anemic woman, 22 years old, five years before, suddenly fell and then was insane for a few days, since which time the present condition had existed; left-sided hemianesthesia, sensitiveness to touch on the spinal column, left breast and upper extremity; difficulty with left foot in walking; cold sensation of extremities, globus hystericus, etc. The patient complained of weak vision, asthenopia and diplopia which is only noticed at times; V. O² = 20/XL and is brought up to 20/XX by either -2.00 or $+2.00$. Fundus and media normal, a candle held in the median line at 4 m. is seen double, the same holds true on raising or lowering the candle, on fixing an object for a longer period the same becomes dim. There exists a distinct heterophoria; on account of the tiring of the eye the exact visual field cannot be determined, but does not extend in any radius more than 20° or 30° , and is the same at 50 cm., and at 2 m., with the wool test the patient mistakes purple and violet even in the near; at greater distances she mistakes bright green for gray, red for dark red, blue for light green, etc. Also the peripheral perception of colors differs so greatly from the physiological laws, the visual field bring largest for red, somewhat smaller for yellow, smaller still for green and blue, and smallest for violet, furthermore it is noticed that this sequence coincides with the color spectrum. Although I failed to find in this paper mention of the crossed diplopia in the near which Königshöfer names "convergence stare," it must have been present in the case of Ogutsi, as the case showed a marked insufficiency of convergence, and the patient according to the author in reaching for a bottle standing on a table next to her, saw double. This phenomenon must also exist in the distance as well as near, although no mention is made of it.

ABSTRACTS FROM DUTCH OPHTHALMIC LITERATURE.

BY

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(Quarter ending December 31, 1902.)

TRANSACTIONS OF THE TWENTY-FIRST MEETING OF THE NETHERLANDS
OPHTHALMIC SOCIETY AT ARNHEM, MAY 25, 1902.—EIGHTEEN MEM-
BERS PRESENT. PRESIDED BY PROF. H. SNELLEN, JR.

Strabismus.

PROF. DR. H. SNELLEN, JR., gives a summary of the different theories of strabismus up to Donders' time. Donders first demonstrated a connection between hypermetropia and convergent strabismus (77 per cent.), next to the necessity of accommodation for seeing distinctly comes the large angle. The strong tendency toward single vision with both eyes prevents most hypermetropes for squinting. With a strong hypermetropia a relative insufficiency of the accommodation is often connected, which lessens the tendency for divergence. The high hypermetropes will prefer binocular vision, even if diffuse, over distinct vision which requires the utmost exertion. These then are the reasons why all hypermetropes do not squint, but only those who easily abandon their binocular vision for different reason. Strabismus begins between the 5th and 7th year, only exceptionally after the 7th. It begins as periodical squint; the shortening of the muscle, which is only in the beginning dynamical, goes over in a organic one, so that in older cases by correcting the hypermetropia not sufficient improvement can be made, but operative interference will be necessary.

In a similar way Donders explained the strab. divergens in myopes. As the relaxation of the accommodation in-

duces relaxation of the convergence, and as only at a short distance distinct vision is possible where the convergence should be exerted strongly, so a small inducement may be sufficient to yield toward relaxation of the convergence and the patient squint outward. The often negative angle and enlargement of the bulb tend in the same direction.

As Donders theory does not explain all the cases, Hensen, Grut and Parinaud looked for other causes. The last one however made no progress, with his "*vice de développement de l'appareil de vision binoculaire, empêchant la convergence des yeux sur l'object fixé.*" The conv. strab. which is often found in myopics, as was as the different degree independent from the degree of hypermetropia, remain unexplained. On the contrary cases are seen where no strab. exists, although all causes for it are present; Prof. S. knows two brothers, both hypermetropes with amblyopic right eyes, and two brothers twins, hypermetropes with congenital blindness of one eye; they do not show any deviation in position.

Sn. gives hypothesis depending on two facts already known, 1st, Strabismus begins as a rule early in life. Priestley Smith found 60 per cent. of his cases, where the strab. began before the 4th. His own experience teaches him that it is not so exceptional, that it begins at or shortly after birth and according to the parents very often *after convulsions*. 2d, Paresis of the abducens can go over after recovery in concomitant strab. Sn. saw two striking cases; he was consulted by Mr. V. in 1898 on account of double vision, Sn. diagnosed abducens-paresis, this recovered so that the mobility of the bulb was entirely restored, but a strab. concomitans remained; tenotomy of the interni brought the normal condition back. Sn. knew that in his second case the condition had been previously normal. Pat., 27 years old, had asthenopic complaint in July, 1891, with hypermetropic astigmatism. Four months later he got an abducens-paresis with severe headaches. In 1898 a marked deviation was noted. In 1899 paresis was cured, the mobility of the bulb normal, but a strong concomitant strab. present, which was relieved through operation. So Sn. thinks that the real convergent strabismus can originate after and from a paresis of the abducens. His theory

only completes Donders'. Donders theory explains the periodic (symptomatic) strabismus, and why conv. strab. is found mostly in hypermetropes. According to Snellen the remaining deviation arises from a contraction of the M. internus, which chiefly appears with hypermetropes (in connection with the accommodation), but is not excluded with emmetropes or even with myopes; it explains the great deviation with little hypermetropia and makes it clear, why the strab. happens more with high than with weak hypermetropia, as it would be quite accidental that a case of high hypermetropia, of itself rare, should be affected with a disease totally independent from the hypermetropia. The other causes which prevent binocular vision or make it of less value, are of importance so far, that they support the once apparent deviation.

The unexplained cases of diverg. strab. must be explained as consequent to the paresis of the M. internus, trochlearis or associated convergence.

Growing Together of the Lens and the Cornea.

DE VRIES, DR., demonstrated the eye of a woman, 33 years old, who had had 17 years previous, an eye-disease, after which the right eye became blind. On examination was found a conjunctivitis trachomatosa, pannus corneae with central leucoma, miosis, a white mass in the pupil, shallow anterior chamber, T. + 3, amaurosis absoluta. Microscopical examination showed a deep seated yellowish spot in the pannus to be a growing together of the iris-stroma with the cornea. The white mass in the pupil and the central leucoma are connected by a cone shaped, string, the base adhearing to the lens capsule, formed of fibrillary tissue, poor in nuclei, receiving a few vessels from the iris. The membrana Descemetii is lost, where the strand connects with the cornea but it appears at the margin over it, so that it covers the entire strand and partly the anterior capsule. This can be explained the easiest when we consider the Descemet membrane to be a product of the corneal-endothelium.

The Descemet membrane increases in thickness with age. DeVries measured the thickness of this membrane in different eyes and found

In the newborn cadaver about	1,5 mikron.
Child 2 years old glioma	2,25.
Child 10 years cyclitis	5.
Man 20-25 years hyalitis with streptococci	5.
Full grown Javanese cadaver	5,5.
Woman 59 years, glaucom, ulcus corneae	6,25.
Woman 77 years, glaucoma	6,25.
Woman 70 years carc. bulbi	8,75.
Woman 77 years, cadaver	8,75.

which shows the increase in thickness with age, however in no relation with the growth of the eye the described eye showed a pathological thickness of the Descemet membrane; in most places on the cornea the thickness was 10 mikron and at the synechia more than 50 mikra.

The Treatment of Luxatio Lentis Congenita.

FABER, DR., was consulted by a 14 year old boy, who had always seen badly. which was increased for the right eye at the age of five by a slap against it. The left pupil was small, the right one medium size, irididonesis more in the right eye. V. O. S. with + 10 D.: 2/24, also with = 10 D. V. O. D. with + 10 D.: 2/60, also with = 10 D. No corneal astigmatism, no improvement of the vision with cylinder lenses. The lens margin passes in both eyes through the middle of the pupil.

F. considered reclinacion indicated for the right eye, discission for the left. Under artificial light and chloroform narcosis, after instillation of atropine, F. tried with two needles to loosen the lens capsule at its superior side by making a rotating motion of the lens around its axis. This failed, so that F. then passed the lens backward, which remained out of the pupillary space. An ample discission was performed of the left lens. Next day the lens was visible again in the right eye and 4 days later a discission was made under cocaine. A week later patient went home with the swollen lenses, no irritation present, 6 weeks later V. O. S. with + 10 D.: 3/18; V. O. D.: with \times 10 D. 3/24, most of the lens mass was resorbed. Still 3 months later a small lens portion remained behind the inner-upper iris. V. in each eye with + 11 D. 5/18. No astigmatism. Patient was ordered glasses + 12 D.

Demonstration of Röntgen-Photographs.

LANS, DR., showed photographs made by Prof. Wertheim Salomonson, where the transillumination went from the back of the head toward the front.

The photo's of a patient who was accidentally hurt with a Flober gun was shown 10 minutes after the accident a slightly bleeding wound at the nasal side of the right orbital margin was seen 1 cm. above the canthus internus. A probe could be put in for some 3 cm. without meeting any hard resistance. The movements of the eye inward and upward were limited and painful. The pupil, not wide, reacted to light; an extensive subconjunctival hemorrhage was present. Tension normal. A large retinal hemorrhage of the entire nasal side was found with the ophthalmoscope, while the media were clean. Vision: $1/8$, and for the temporal side: 0. As a myopia of 6 dioptries exists in both eyes the slightly increased exophthalmus on the right side is difficult to demonstrate. A slight edema of the right temporal region of the face and of the upper lid developed, 10 days later the small retinal hemorrhages had disappeared, chorioidal ruptures at the nasal upper and lower side of great extension could be seen with large blood extravasations in the retina. The papilla N. Opt., became white; V. $1/60$ eccentric, 10 days later the wound had healed entirely with a small invaginated cicatrix; the ocular movements became normal, but a large narrowing of the visual field remained. With the Roentgen rays from backward a bullet is easily seen. After computation its place is 22;5 mm. from out the median line and 24 mm. from the small piece of metal, which was connected with the lower eyelid, resting on the bottom of the orbit and outward the bulb, near to the optic nerve. Its atrophy most probably is caused by connective tissue, which constricts the nerve.

It is of the greatest importance to state this early in regard to the prognosis, Dr. Hansell (Ophth. Review XVIII) mentions a case, where a bullet had penetrated behind the bulb; after some quiet weeks symptoms of sympathetic irritation supervened forcing enucleation; the bullet was found within the optic nerve.

The general rule must be that as long as the bullet does not cause hindrance it may be left alone.

Tumor Intra-Ocularis.

DHONT, DR., demonstrates a gliosarcoma, enucleated by Prof. Snellen, Jr., in a 4 years old child. From birth "no light" had been in that eye. The bulb was much enlarged, the optic nerve much thickened, even at the foramen opticum. It shows the endophytic form, namely the proliferation happens within the vitreous body without solutio retinae. The sheath of the optic nerve is filled with tumor-tissue; 5 months later the child died, totally emaciated, without return in the orbit, constantly complaining about headache.

A second gliosarcoma was removed by Prof. Snellen, Jr., from a two years old child. The eye appeared strange from the third week after birth. The bulb was much enlarged and fixed to the back part of the orbit by abnormal adhesions. It belonged also to the endophytic type. In both eyes the vitreous body is changed in a necrotic mass, in some places in connection with the bulb wall; in the second eye chalk had impregnated and large hemorrhages were present. Already 14 days after the operation a return had taken place in the orbit.

A New Eye-Muscle (Musculus Papillae Optici) Illustrated.

NICOLAI, DR. C. (Verh. d. Koninklyke Akad. v. Wetensch 2 sectie, dl, IX, no: 5), observed in frogs' eyes where he punctured the anterior chamber directly after death, that the opticus moves forward immediately so that a true papilla macroscopically observable arises. The lamina basis that part of the chorioid, which is in continuity with the retina, is the prime mover. A ring of elastic or muscular tissue must be here, which contracts on the sudden decrease of tension in the vitreous body.

This change suggests a similar one in the human eye, some times to be seen after long continued accommodation; swelling combined with "stauungs" symptoms, which we speak of as choked-disc. A chlorotic girl, 14 years old, showed very marked stauungs-symptoms, she had a normal vision, but her accommodation measured only 2 dioptries. The cure of these cases with ferrum will show an increase of the range of accommodation, as a sequence of the improved general condition.

A second reason to suppose a muscle in this position is the clinical fact, that many cases of "papillitis," where

the nerve tissue is not affected, respond very quickly to the internal use of salicyl. sodae or quinine. As the vision hardly suffers, it seems not improbable, taking in consideration the favorable action of the drug, that a sick muscle is the cause of the papillitis.

The muscle cells in the central part of the opticus belong to 3 groups. I. *Portio circularis*. This part of the muscle is just, where the opticus is the thinnest, in the prolongation of the *membrana basalis* and pigment layer. II. *Portio longitudinalis*. This part forms a sort of collar; its fibres connect the chorioid with the external part of the optic nerve. It is identical with the so-called "inter-medial tissue of Kuhnt," the position of which has been falsily described, even by Schwalbe, resulting from the changes in pressure and moving of chorioid, retina and optic nerve after death, when it will come between retina and nerve. III. *Portio radialis*. The most developed part of the muscle, going from the *lamina cribrosa* to the place where the *art. centralis* divides. The bundles go from the periphery to the center, where they cling to the connective tissue forming the canal surrounding the bloodvessels. Between periphery and center they give off many branches, which connect with other shoots, so that a sort of sieve is formed. The muscle tissue stretches to form the *lamina cribrosa*; the muscle bundles are within the connective tissue bands, which form the lamina. On account of the muscle cells this part of the lamina stains differently from the posterior layers. The most anterior part is directly connected peripherically with the circular and longitudinal bundles; more posteriorly the muscle bundles originate from the bordering part of the sclera, which probably still belongs to it. Staining after Weigert showed that no connection whatever exists with neuroglia tissue.

Smooth muscle tissue is recognised; 1, its form; 2, by its behavior with different stains; 3, by its digestibility with trypsin; 4, by its contractibility; 5, by its double refrangibility. V. Gieson's method stains the muscle-cells lemon yellow, while the connective tissue elements become red in different shades. Nerve tissue and epithelial cells also become yellow. Smooth muscle cells hardened in palladium-chlor, become straw yellow. Trypsin

dissolves the muscle-cells at a temperature of 40° C. Nicolai has been able to get a satisfactory result in tests 1, 2 and 3; but 4 and 5 gave negative results.

Nearly in the same way as in man this muscle is developed in the monkey. Very distinct in the cat, where it is a direct continuation of the chorioid, borders the corpus vitreum; in the central part of the opticus it is connected with the connective tissue, which does not enclose blood-vessels. In the pig a portio radialis, in the camel a portio longitudinalis can be demonstrated; the optic nerve does not pass through the sclera as in man through one large opening, but through many small holes, so that the lamina cribrosa is absent. The Icelandic horse gives fine specimens. The wolf has this muscle, and the lamina cribrosa is little developed.

The Facial Expression in Contraction of the M. Frontalis and M. Orbicularis Oculi.

Cox, DR. W. H. (*Wochbl. f. Genesek*, Feb. 8, 1902), has specially studied the muscles around the eye, as they chiefly determine the facial expression accompanying the physical condition, which we call attention.

We must distinguish interested attention (*intentio animi*), when the muscles around the eyes are tense from expectant attention (*attentio animi*), where a distinct observation or idea is not understood. In the last case the eyes are wide open and the forehead is furrowed, while in interested attention the eyebrows are frowned and the eye cleft somewhat narrowed. Contraction of the M. frontalis furrows the forehead, while the frowning is the result of contraction of some muscles, which make vertical folds between the eyebrows (on the glabella).

The questioner contracts his musc. front.; one who answers, uses his mm. orbitales interni. On the contrary one who contracts his musc. front. does not understand and one who contracts his musc. orbit. does understand. Interested attention is qualitative different from expectant attention; it belongs particularly to mankind and is of very little importance in animal life; corresponding with this we find that the muscle, which contracts with interested attention, the musc. corrugator supercilii (and a few others) is only found in man and is wanting or exists only with a few bundles in (anthropoid) apes.

An analysis follows of muscular contractions around the eye, with photographs.

Suggestive Therapeutics in Ophthalmology.

STRAUB, PROF. (*Weekbl. T. Geneesk.*, March 1, 1902), says in the medical society of Amsterdam: In ophthalmology it is easier than elsewhere in medicine to find out the part played to suggestion in the process of healing. He refers especially to blepharo-spasmus nervosus, asthenopia and amblyopia nervosa. There are patients who show much greater sensitiveness for light than corresponds with the organic change in cornea or iris. They keep their eyes shut tight and can be examined only with the greatest difficulty. In another class of patients the eye cleft of the sick eye is halfway closed and a continuous tonic contraction can be observed from the form of the eye cleft and the goose-foot at the outer canthus. These conditions last for weeks and prohibit a cure. Experience teaches that most corneal affections heal quickly under proper care without any therapy, as soon as the nervous spasm has passed off. Some of the medications show directly the psychic character, i. e., the plunging of the light shunning children in a pail of cold water; the instillation of cocaine, assuming that the spasm will be overcome and the eye cleft remain open, although the effects of the alkaloid are not lasting. Good nursing works psychically because patient's attention becomes diverted from his condition; also cutting of the outer canthus. This operation does not prohibit directly afterward that the patient blinks strongly, but next day after removing the bandage the lid spasm is gone. Even judicious examination of the eyes, that means lifting of the eyelid with forefinger without force, has a beneficial effect.

Nervous blepharospasmus is found most frequently in scrophulous children, sometimes in children with parenchymatous keratitis and in adults with corneal ulcers. Straub takes patients with trachoma for one week into the hospital, where the patient learns how to clean his eyes himself and where he gets rid of his sensitiveness for light. Then the time has come to combat the trachoma with more aggressive mechanical and chemical means.

Nervous amblyopia and asthenopia can be recognised

through the influence of neutral lenses on the vision and the anomalies of the visual field, the patient thinks that he cannot see, and therefore he cannot. This unfavorable autosuggestion must be neutralized. We are generally powerless when the amblyopia has existed very long, but very efficient with a recently existing amblyopia and with asthenopia.

In nervous schoolchildren an absence of the evening class for some six weeks often gives good results; sometimes extra-nourishment or daily cold bathing the region of the breast and back. For adults the work must be regulated; sometimes systematic exercise of the vision is necessary to restore to the patient his visual power. S. treated this subject lately in his "Ocular Therapeutics." Some people have lost their sight through excessive work; when they use their eyes they begin to ache and to tear, they can continue only a few minutes. Fechner suffered from this disease and cured himself with systematic exercise. The patient must continue to work just for a moment after he becomes tired; in this way the will becomes strengthened. The duration of the first exercise can be very short; from day to day the time of fatigue will recede. The weak ones must be guided from week to week. Only few patients must be treated with force.

The Normal Pupillary Width.

TANGE, DR. R. A. (*Weekbl. v. Geneesk.*, March 8, 1902), examined some 1000 pupils. He put the person before a window at a distance of 2.5M., let him look at a distant tree for 5 minutes, when the pupil had a constant size and was measured. Then the patient was placed so that light came obliquely, the adaptation lasted some 10 minutes. The strength of the light measured with Weber's photometer was with direct incident light (first position) 700-1100 M.C., with sideways illumination (2nd position) 30-50 M.C. A sort of filiere of Charriere was used as pupillometer (method of Jessop, Haab, a. o.). A certain number were measured with artificial light of 180 M. C. and the pupillary width was found hardly to differ from that found in daylight.

The largest pupillary width was found in children: gradually it becomes smaller with age until 60th year, after which it narrows only very little. In woman the pupils

are larger than in man, although the difference might be slight; Hyperopes have a narrower pupil than emmetropes of the same age; the width decreases with increased hyperopia. Young myopes have large pupils, older have as emetropes; the higher degrees of myopia do not follow a rule; all these differences will be found more marked with a weak illumination and a much higher age. The color of the iris has no influence on the pupillary width.

It is easy to appreciate the different widths in the different refractive conditions from the accommodation. However a direct influence cannot be accepted. We have to consider an increased tonus of the circular iris-muscle. With hypermetropia continuously and with emmetropia with every distance the accommodation must be used, where with a narrowing of the pupil is connected. This might leave, even with the accommodation at rest, a higher tonus of musc. sphincter iridis. The large myopic pupil might depend on the seldom exerted accommodation. The increased diminution in size of the pupil with age might depend on weakening of the antagonist of the musc. sphincter iridis. Even in old age, as both muscles have lost in force, the stronger musc. sphincter iridis makes the pupil very small. Histological investigations must determine this hypothesis.

Carcinoma Oculi (Illustrated).

DE VRIES, DR. W. M. (*Weekbl. v. Geneesk.*, April 19, 1902), examined an epithelioma, which existed for two years in a woman aged 98 years, and had spread over the larger part of the eye. The anterior part of the eye is rough, grayish-red with a nearly central defect, wherein a greyish white little knodule as descemetocoele. The anterior part of the eye was examined microscopically and shows an epithelioma, which destroyed the pre-existing tissue and penetrates in the depth. An infiltration of leucocytes was present at the border of the tumor, and new bloodvessels had grown in the cornea. Nowhere any collateral hyperplasia of the epithelium. This infiltration in a vascularized tissue is not limited to the conjunctiva, but penetrates partly under the corneal epithelium, and destroys the membr. Bowmanni, which ends in the same way as in the tumor mass, namely melting away without falling out in fibres. The remaining membr. Bowm. is in-

terferred in different places; it is as if a hole was made and the opening filled up with young connective tissue, which extends also under the membr. Bowm. and lifts the epithelium domeshaped, which is thinner there than normal, while the basic epithelial cells keep more or less perpendicular to the cone. In some places where the tumor extended above the membr. Bowm. we see the membrane folded double.

A Contribution to Our Knowledge and an Explanation of Erythropsia.

PINO, DR. C. (*Weekbl. v. Geneesk.*, May 3, 1902), has made a very laudable use of his involuntary residence in Kandy, Ceylon. Looking at a place of the strongly illuminated sky, P. saw after a minute this part carmine red; going then in the dark he saw the well-known symptoms of erythropsia.

He studied the symptoms under the influence of strong light on the central part of his retina with no or weak illumination of the periphery, and this same influence with a homatropine dilated pupil. After fixation of a strong illuminated part of the sky during some half minute the strongest illuminated parts, i. e., white clouds, became dark; after one minute all became tinted carmine red. Movement of the eye made this disappear. After remaining in the light for some three minutes and going quickly in the half dark, covering the non-illuminated eye, only a dark spot was seen on the fixed paper during some 15 seconds, then a yellow-green image of the fixed sky appeared; after half a minute this changed and carmin red, reaching maximum after one and a half minutes, and then disappeared regularly. Pino could corroborate the statement of Fuchs that the erythropsia is less intense in the center; He made a white cross on black paper and found the middle zone uncolored after a short illumination; this central one became colored after long illumination but less intense than the bordering parts. Sometimes the yellow-green was preceded by a blue-violet; sometimes the blue violet was in the center of yellow-green. The symptoms were about the same after homatropine dilatation, only with sufficient illumination they appeared in the entire visual field.

Pino concludes: that erythropsia is a complementary

after image of yellow-green light, which originates when white light passes the blood capillary in the inner layers of the retina, and which shows its effect only, when the retina purple of the rods has disappeared through excessive illumination, as the function of this purple consists in neutralizing these yellow-green rays.

If this explanation is right, 1st. it must be impossible to excite erythropsia with a glass that stops yellow-green rays. Pino and Fuchs could excite erythropsia with carmin red glasses; 2. a yellow-green glass must give symptoms similar to those of erythropsia, which P. could confirm; 3. colored glasses which let pass enough yellow-green rays, must provoke symptoms of erythropsia complicated with symptoms dependent on the color of the glass. P. could also demonstrate this.

P. thinks that the blue-violet, which he noticed sometimes, must be considered as a positive after image of the color proper of the light. For white light to reach the macula, it must be of a bluish-white tint on account of the yellow pigmentation of that locality. With excessive illumination also more blue rays will reach the retina, than the yellow pigment can absorb, so that a part penetrates toward the perceiving layer. The blue color is not seen through the intensity of the light but manifests itself in the after image.

The Operative Treatment of Strabismus Complicated with Rotation of the Eye Round the Corneal-Axis.

KOSTER, PROF. W. (*Weekbl. v. Geneesk.*, May 31, 1902), reaches the following conclusions:

1. The postparalytic strabismus can be operated, when the paralysis proper has as good as disappeared. Even very marked deviations of the position can be corrected through advancement and tenotomy on one or both eyes.

2. The rotated strabismus (strabismus naso-s. tempororotatus) must be chiefly corrected in the eye wherein it originated. The convergent and divergent strabismus, as well as vertical strabismus can be corrected in each eye, but we have to consider the extent of the perceptive field (field of fixation).

3. To perform a rotation of the eye we may:

- a. Shorten the musculus rectus inferior or do tenotomy

of the musc. rectus superior, and the contrary for the nasal rotation.

b. Tenotomise one of the recti muscles with cutting of Tenon capsule parallel with the limbus cornea at the side of the tendon toward which the eye must become rotated.

c. Perform a collateral transplantation of the insertion of one of the recti muscles in a direction contrary to the wished for rotation. The tendon must be shortened 1 mm. for every 3° strabismus naso-rotatus, and also 1 mm. for every 9° strabismus naso-rotatus: at the same time the capsule of Tenon must be entirely loosened perpendicular to the tendon over the bulb, but not over the muscle itself. The collateral transplantation of the insertion must be circa 3 mm. for all degrees of rotation; only when the shortening of the muscle must be made larger on account of some other anomaly, the insertion must be made somewhat less laterally, i. e., 1.5 mm.

4. It is good to operate under the control of the double images to obtain an exact correction.

K. reports the following case: A 28 year old medical student showed a marked degree of strab. divergens and sursumvergens of the left eye. When 5 years old he fell with the left eye on a pin. Vision in both eyes normal. Strab. divergens O. S. 28° , sursumvergens 10° . He can squint alternately, but uses the right eye alone for reading. Preliminary examination of the muscles shows a good motility of both eyes in all directions. He sees crossed double images; the apparent image (of the left eye) is on the right side downward; turned with its apex away from the real image. The relative position of the double images remain the same with movement in different directions: alone in looking upward the difference in height lessens. Measured with Maddox rod (vertically) the sursumvergens is 9° . Comparing with oblique lines the strab. temporo-rotatus is estimates 5° . With Hering's fall experiment 4 mistakes on 20 trials. Patient sees binocular after correction of the deviating position with prisms. First the M.rect. internus of O.S. is shortened 8 mm. and the insertion transplanted 1,5 a 2 mm. upward without cutting the tendon. Next a full tenotomy of the M.rect. externus, with especially Tenon's capsule is loosened upward. No wound reaction, and the

strab. diverg. is over corrected, still a difference in height is present, 8 days after the first operation tenotomy of the musc. rect. inferior O. D.; the tendon is cut first and then Tenon's capsule so far inward on both sides that the difference in height is as good as corrected. This is done under the control of the double images, at the end Tenon's capsule is cut at its outside carefully so far as to bring the images entirely parallel. A strab. conv. of 3° remains uncorrected. Next day strab. conv. of 2° , Pat. begins exercises with stereoscope. Six weeks later the patient is entirely cured with Hering's fall-experiment no mistakes, good stereoscopic vision, head position normal, no trouble with reading. At a distance of 6 M. still 1° latent strab. conv.

Unilateral Quinine-Amblyopia.

WESTHOFF, DR. C. H. A. (*Med. Weekbl.*, May 17, 1902) observed a second case of this kind. V. Graefe described the first case in the *Arch. f. Opht.* Vol. III., p. 396. Male, 68 years old, consulted Dr. W. on account of loss of vision in right eye; is hyperopic 2.75 D., V. O. S. $4/5$, V. OD. $4/8$. No fundus changes to be seen. A month later patient returned complaining that after the vision had been normal again it became worse during the last few days; V. O. D. was $3/24$. Urine normal. With the ophthalmoscope the retinal vessels were somewhat narrower than in the left eye. A careful questioning elicited, that three months previous to his first visit he suffered from fever (he has lived 40 years in Java), for which he took 10 grains of quinin, after 8 days he doubled the dose, even some three weeks later on a particular occasion he took at once two grams, which made him dizzy, produced noises in the ear and made him notice a failure of vision; he noticed distinctly that the right eye was much worse. As the quinine pills did not cure him he took it in another form also without success as regards the fever. He went to another place, used no medicine and the sight of the right eye became slowly normal. Back at home he felt feverish, took a large dose of quinine and directly the vision of the right eye diminish, which W. found $3/24$. The quinine was stopped and some 3 weeks later the vision of the right eye was $4/8$. No narrowing of the field of vision. Other organs normal.

OPHTHALMIC NEWS, ITEMS AND ANNOUNCEMENTS.

(Under this heading the ANNALS will publish items of interest. Please address Dr. B. E. Fryer, 520 E. Ninth Street, Kansas City, Mo.)

At Jena, Dr. Ernest Hertel has been appointed Professor of Ophthalmology.

Dr. Salomon Klein has been appointed Professor of Ophthalmology at Vienna.

At Halle, Dr. Barunschweig has been accorded the title of Honorary Professor of Ophthalmology.

Dr. Thos. A. Woodruff has been appointed one of the Ophthalmic Surgeons on the staff at St. Luke Hospital, Chicago.

Dr. Nathanael Feuer, professor at the University of Buda Pest, died November 25. He was 58 years of age.

At the Egyptian Medical Congress Dr. Mohammed Bey Eloni was President of the section of Ophthalmology.

Dr. Theodore F. C. Van Allen, died October 28. He was Ophthalmic Surgeon at St. Peter's Hospital New York.

Dr. James Bordley, Jr., was recently appointed to the chair of ophthalmology at the Woman's Medical College of Baltimore.

Dr. Mitsiyasu Inouye our Japanese editor has opened an office for private practice in Tokio, Japan, Utsi-Saiwai-Cho I Chome.

Dr. E. E. Blaauw, Buffalo, New York, was made a member of the Netherland Ophthalmological Society at the 21st meeting May 21, 1902.

The Trustees of the Carnegie Institute will, it is said, revive the Index Medicus and place it upon a secure and permanent foundation.

Among other appointments recently made by the trustees of the University of Pennsylvania is that of Dr. John F. Carpenter, Instructor in Ophthalmology.

Professor Schweigger was decorated with the the Order of the Red Eagle, on the fifth anniversary of the commencement of his professional work, 13th. August.

Dr. Charles A. Oliver, of Philadelphia, one of our Editorial Staff, has had the honor of Honorary Membership conferred upon him by the Mexican Ophthalmological Society.

Dr. Zimmerman of Stuttgart has resigned as editor of the *Ophthalmologische Klinik*, whose direction hereafter will be in the hands of Pro. Dr. Königshöfer.

The distinguished ophthalmologist, Dr. Herman Knapp, of the medical school of the College of Physicians and Surgeons, has recently been made Emeritus Professor of Ophthalmology.

It is to be regretted that the article, "Report of Two Cases of Congenital Anomalies of the Eyes. Illustrating the Transmission of Such Defects from Mother to Daughter," by William Campbell Posey appearing in this issue was also accepted and appears in the *Ophthalmic Record*, February, 1903, unknown to the editor of the *ANNALS*.

Dr. Eduard Meyer died recently in Paris, where he had practiced since 1863. His work on the Disease of the Eye is a thoroughly scientific one. It was translated into German, Spanish, Italian, Russian and Polish.

The new salt of silver, argyrol—is receiving much attention from oculists. It is even less irritating than protargol and seems at least fully as effective, and its penetrating power greater. It contains 30 per cent. of silver.

Dr. H. V. Würdemann of Milwaukee will leave April 11th, for several months vacation in Europe and Africa. He will attend the International Medical Congress, which meets in April at Madrid, Spain, as a Delegate for the American Medical Association.

New York Eye and Ear Infirmary.—Physicians and others connected with the nose and throat department of the New York Eye and Ear Infirmary are protesting vigorously against the resolution to discontinue this department to make room for the increased number of cases of trachoma.—*Jour. Amer. Med. Association*.

Gets \$10,000 for Loss of Eye.—Ten thousand dollars is the value of an eye, according to a verdict for damages awarded by a jury in the Brooklyn supreme court in favor of Frederick H. Dittman. The plaintiff was employed by an electrical company, and was injured by a broken belt on the machinery.

Writing on "Advance in Ophthalmic Therapeutics," D. B. St. John Roosa, M. D., LL. D., of New York, says the following in the *Medical News*, of Sept. 27th:

"Euphthalmin is a valuable agent for securing transitory dilations of the pupil, for the purpose of ophthalmoscopic examination, and harmful effects, if they ever occur, are entirely exceptional."

Friedenwald Memorial.—Memorial services in honor of the late Dr. Aaron Friedenwald were held at the McCulloh Street Synagogue, November 9. Addresses were made by Rev. Drs. Mendes of New York, Schnuberger of Baltimore, and Cyrus Alder of New York, while the medical career of the deceased was discussed by Dr. Solomon Solis-Cohen, Philadelphia.—*Journal Am. Med. Association*

F. Despagne, for many years editorially connected with the *Recueil d'Ophthalmologie*, died at Biarritz, Aug. 11th, 1902, at the age of 48 years. He was for fourteen years the chief of Galezowski's Clinic in Paris, and besides his editorial work, contributed numerous original papers to the above journal. From 1892 to 1897 he was secretary of the Paris Ophthalmological Society.—*Ophthalmic Record*.

Episcopal Eye, Ear, and Throat Hospital of Washington.—A new building, with a frontage of 57 feet and a depth of 112 feet, will be added to the institution. The lot has been bought and over \$11,000 has been subscribed and paid into the treasury as a building fund. Building operations will begin as soon as the required sums are subscribed.—*Amer. Med.*

Dr. Herman Knapp has recently reported a case of the comparatively rare form of aphasia, separate letter blindness—a condition distinct from word blindness. In these cases, the component letters of a word which when separated are not recognized, but when the same letters are placed in juxtaposition the word becomes at once known. Possibly if this form of aphasia was sought for, it might be less rarely found.

In the section of Ophthalmology at the coming International Medical Congress, Dr. Santiago de los Arbos, will preside. Among other subjects to be considered, there will be discussion on the surgical treatment of the diseases of the lacrimal passages, the need for unification of optometric scales; optic neuritis in acute affections; and the action of mydriatics on the pupil, accommodation and intraocular pressure.

A New Eye Disease.—A new and peculiar disease, called the "gas eye" is prevalent among the employes of the gas pumping stations throughout the gas belt in Indiana. The pain is severe and physicians are unable to determine the cause of the disease. Men working around the big gas compressors are in escaping gas all the time. Their eyes become inflamed, tender, and it is almost impossible to expose them to the light. Permanent injury to the eyesight has resulted in several cases.—*Amer. Med.*

Trachoma in the Schools.—According to Health Commissioner Lederle, the medical inspectors have found 18 per cent. of the public school children examined suffering from trachoma. So far, 988 pupils have been excluded because of the condition of the eyes, 814 of these being in the grammar schools. The mayor has been asked for an appropriation of \$21,000 to carry on the work of inspection.—*Jour. Amer. Med. Association*.

Trachoma in New York City.—Considerable interest has apparently been caused over the prevalence of trachoma. Not a few children have been excluded from the schools, and the hospitals and dispensaries devoted to diseases of the eye have noticed a marked increase in the number of patients suffering from the disease. A

conference of physicians has been held in the city to secure correct data on the subject, and to devise the best means of combating the malady.—Amer. Med.

Changes in the Visual Field in Syphilis.—Ziemssen calls attention to the fact that a syphilitic affection of the brain or spinal cord is associated with an affection of the optic nerve, limiting the field for red and green, even when the general visual field is unimpaired. The course of the main affection can be traced by inspection of the visual field as the conditions improve or grow worse, and it is thus a criterion of the benefits from treatments. In some of his patients the improvement was marked under mercury, but as soon as it was suspended the visual field gave evidence of retrogression. The more intense the treatment and the longer it was continued, the better the results in the visual field.—Amer. Med. Association.

W. B. Sanders & Company desire to announce to the profession that they have established a branch of their business in New York. For this purpose they have secured a suite of rooms in the Fuller (The Flat-Iron) Building centrally located and easily accessible from all parts of the city. Dr. Reed B. Granger, for many years managing editor of the New York Medical Journal, together with a representative who is thoroughly familiar with the methods of the Philadelphia house, will be connected with the new branch; and Mr. W. B. Saunders personally will divide his time between New York and Philadelphia.

Drs. Casey A. Wood and Thomas A. Woodruff, of Chicago, have in preparation a work on the Commoner Diseases of the Eye, which, as its title states, is intended primarily for the student and the general practitioner.

We ophthalmologists well know the woeful lack of interest and small knowledge of the general practitioner of our specialty, and this work as with others which reach the family doctor, is very welcome.

The textbook on Diseases of the Eye, by Dr. Charles H. May associate editor on the ANNALS, has been translated and published in German through August Hirschwald of Berlin. It is a fact that many less meritorious works than that of May are translated from the German into our language and but few of our books are translated and published in another language, especially in the German. Those authors of such fortunate and meritorious publications as is that of May's may esteem the translation an honor, especially when made, as in this case, without solicitation of the author; demand having arisen in Germany for a work of this class. May's book is certainly of much value to the medical student.

It is a peculiar fact that the letters and other writing of DeQuincey, Carlyle, Darwin, Huxley and Browning, liberal as they are with references to the continued ill-health of those great writers, have

not before this suggested to the medical profession an opportunity for research into the causal factors of those physical conditions. That the opportunity has not until now been recognized in its proper light is evidenced by the hitherto total absence of any work dealing with this subject. Dr. George M. Gould's Biographic Clinic (P. Blakiston's Son & Co., Philadelphia) which is devoted to this neglected subject should, therefore, prove a most unique and valuable contribution to biographical and medical literature. The work is announced for publication in December.

Dr. Gould has gathered from biographies, writings and letters of the five named men every reference to their ill-health. Each endured, as is well known, a life of suffering which made almost every day a torment and by which their work and worth as an asset of the nation and civilization was conditioned and often rendered morbid. The cause of their affliction was an utter mystery to their physicians. No explanation explained, and no cure cured. Dr. Gould has gone into the "why" of this very thoroughly and the conclusion reached by him, from logic and a careful summary of the clinical symptoms, is that each of the writers suffered from eyestrain, and that scientific correction of their ametropia would have transformed their lives of misery into lives of happiness. A history of the discovery of astigmatism and eyestrain, with a discussion of its indications and responsibilities, completes the work. It is interestingly written, and will undoubtedly meet with a ready sale among medical men and those interested in the works and lives of the quintette of great writers.

A. B. H.

The Trustees of the New York Ophthalmic and Aural Institute (Knapp's) have secured a lot at northwest corner of Central Park west and 64th street, where they propose to build a new home for the Institute. The cost and equipment of the new hospital building (including the land) are estimated at \$500,000. This Institute was incorporated in 1869. In the first year of its existence 1,728 patients were treated and 228 more important operations were performed; in the last year 13,357 new patients were treated, and 2,622 such operations were performed. In all 243,793 patients have been treated (14,466 as inmates in the hospital) and 23,225 operations performed.—*Ophthalmic Record*.

Eyes of School Children.—A systematic examination of the eyes of school children has been carried on in Boston during the past few years and statistics obtained of over 200,000 pairs of eyes. An analysis of these examinations shows that in the primary schools nearly all the children enter with normal eyes. In the higher grades 25 per cent. have become myopic, while in university life the percentage of myopia has increased from 60 to 70 per cent., which shows that the number of nearsighted pupils increases from the lowest to the highest schools, and that the increase is in direct proportion to the length of time devoted to the strain of school life.—*Amer. Med.*

Concerning Specialism.—It is irrational to treat one organ with-

out a knowledge of the interrelation of the various organs and parts of the body. This is knowledge which, of course, the specialist must have, and which the properly equipped and conscientious worker in a special field does have in far greater degree than is usually placed to his credit. The deeper a man goes into any branch of medicine, the more clearly he sees these very interrelations which are so often the keynote of successful treatment, and he sees them, we are inclined to think, at times more clearly than the physician who scans a broader field. That there are so-called specialists who do not attain to this conception of their work is self-evident, and the sooner such men are made to feel their limitations the better it will be for the profession at large. The ideal specialist is he who goes deeply into a subject and then extends his knowledge into every related field. Such a man is hardly to be looked upon as narrow or bigoted, or even incapable of entering into the finer appreciation of the idiosyncrasies and temperaments of his patients. It might not be straining a point for him even to act occasionally as "family advisor."—*Boston Med. and Surg. Journal.*

At the annual meeting of the Board of Governors of the Presbyterian Eye, Ear and Throat Charity Hospital, Baltimore, the Medical Executive Committee, which has managed the medical affairs of the institution for the last four years, consisting of Drs. Herbert Harlan, Hiram Woods and F. M. Chisolm, was reappointed for this year, with Dr. Herbert Harlan as Surgeon-in-Chief.

Dr. Julian J. Chisolm, who founded the Hospital in 1877, and for twenty-two years was its Executive Surgeon, retired in 1899. Since his retirement the medical management has been conducted by this Executive Committee.

The Western Ophthalmologic and Oto-Laryngologic Association, familiarly known as the "W. O. O. L." Society, is about to become a National Organization. The Committee on Constitution and Reorganization, of which Dr. Casey A. Wood is chairman, with Drs. A. Alt, Edw. Jackson, B. E. Fryer, H. Gifford, W. A. Sheppegrell, J. O. Stillson, J. E. Colburn, H. V. Würdemann, M. A. Goldstein, D. T. Vail, J. A. Stucky, G. R. Holmes, O. J. Stein, W. H. Wilder, E. C. Hotz, W. L. Ballenger, and other representative members have advised the adoption of a new constitution and by-laws, which transforms the Society or rather reincarnates it into the American Academy of Ophthalmology and Otology. The membership is to consist of Members and Fellows, the latter being elected to this distinction on account of prominence in medical science. The membership of the W. O. O. L. Association has so greatly increased, and as it includes many of the prominent head specialists of America, the enlargement of its field is certainly justified. One of the objects of the Academy is to extend the advantages of association to the younger specialists as well as to those of riper experience and of international renown.

We are pleased to note the improved appearance of the Journal of Tuberculosis as is shown by the January number, Vol. V. This Journal is a quarterly publication of about 100 or more pages, devoted to the prevention and treatment of Tuberculosis, edited by Carl and Silvio von Ruck, Asheville, N. C., who are eminently qualified by their experience and scientific attainments for the publication of such work.

An interesting article in the January number is: "Relations between Human and Bovine Tuberculosis," by Prof. von Baumgarten, who agrees with Koch, in that he is convinced that the tuberculous human subject is the principal, if not indeed the sole source for the infection of others. He believes, however, that the disease is not only communicated by the sputum but likewise by ingestion, and also that there is generally an inherited or inheritable anomaly of constitution which favors infection by the bacillus or in some cases there is a direct transmission of the bacillus in the act of procreation or during foetal development from the parents to the child.

Contagious Conjunctivitis.—Standish (Boston Medical and Surgical Journal) has found that a large proportion of the cases of acute catarrhal conjunctivitis can be aborted by dusting iodoform into the sac two or three times at intervals of 12 hours. Ophthalmologists who deny the contagiousness of trachoma must not confuse it with follicular conjunctivitis. The author describes the characteristics of each. Trachoma formerly constituted 20 to 25 per cent. of the cases treated as out-patients at the Massachusetts Eye and Ear Infirmary. The number is now reduced to 3.5 per cent. This is due to the exclusion of trachomatous immigrants and also to improvement in treatment. The latter consists in expression of the granules, Prince's forceps being preferred, and subsequent antiseptics, bichloride 1-500 being vigorously rubbed into the surface. The effect is prompt, the lids opening perceptibly wider in 24 hours. Corneal complications are rare, and in one or two years the disease is cured without visible cicatrices in either conjunctiva or cornea. The average duration of the patient's stay in the hospital has been reduced from 64.5 to 29 days, and the danger of infecting others much lessened. Ophthalmia neonatorum is now treated only in the wards, the child being separated from its mother. There were only four deaths in 82 admissions in 1901, a small percentage considering the weakly and otherwise diseased condition of most of these patients. By flooding the conjunctiva with protargol and thus avoiding the mechanical injury to the cornea in applications of silver nitrate, the proportion of unsuccessful cases and time required for treatment has been distinctly reduced. The unaffected eye is thickly covered with iodoform, cotton and collodion. By using 20 per cent. solutions of protargol all corneal complications have been avoided in those having a clear cornea on admission. In 12 patients with infiltrated ulcers treated immediately by the keratotomy of Saemisch 9 retained a clear cornea over the pupil. In diphtheritic conjunct-

iritis treatment with antitoxin has given most gratifying results. Diagnosis must rest on the clinical picture since laboratory processes are too slow. Blindness and pauperism have been remarkably reduced by improved treatment in these diseases.—[H. M.]—*Am. Medicine.*

Birth Palsy of the Sixth and Seventh Nerves.—At the Ophthalmological Society Mr. Nettleship described a case of this rare condition. Delivery was difficult in consequence of a brow presentation. The blades of the forceps were applied to the right mastoid region and in front of the left ear respectively. At birth the right eye was closed, and there were internal squint and spasms of the hands and arms. When three days old complete paralysis of the right face and internal squint were noticed. On the fifth day a small hemorrhage was detected in the right fundus below the disc. At the end of a month the paralysis had diminished, and after nine months it had disappeared. The injury was apparently a single intracranial hemorrhage at the base of the petrous bone involving the sixth and seventh nerves at the beginning where they are close together. Mr. Nettleship cited another case in which these two nerves suffered, but with separate lesions, the seventh by pressure of the forceps in the parotid region, and the sixth by damage of the orbit. The eyelids in this case were swollen, and recovery was incomplete.—*Journal Am. Med. Association,*

Eye Troubles in London Schools.—According to the London Truth, in April last the London School Board appointed eight ophthalmic surgeons to pay 200 visits each to schools under its control with the object of testing the vision of the scholars. They have submitted an account of their work up to the beginning of the summer vacation, and their report shows 17,245 children have been examined, and serious visual defects have been discovered in 8 per cent. of the boys and 11 per cent. of the girls, the proportion being about equally maintained throughout school life, though the percentage varies enormously in different districts, being small in the better class districts and greater in the poorer. The work done, however, does not end with the production of statistics. Children with subnormal vision have been supplied with a green advice card on which treatment is recommended, while those with bad sight are given red cards to take home, giving instructions as to treatment. Unfortunately the appointment of eight oculists seems inadequate under such circumstances, for, at the present rates of progress, five years will have elapsed before all the children will have been examined.—*American Med.*

“So Strange, So True.—From the *St. Louis Globe-Democrat* we cut the following advertisement:

The Difference Between an Oculist and Optician.—The optician tests your eyes Free and ruins them for you. The oculist is a graduate of medicine who has to take a special course and several post

graduate courses to become one. If you have trouble with your eyes, Go to the Oculist and Pay for the Examination, then bring your prescription to me to be filled. I will save you money. I am the best frame fitter in St. Louis.

Optician and Expert Frame Fitter.

That optician deserves the encouragement of every physician. Both poisons and spectacle lenses should not be sold to the public except upon a physician's prescription. Whatever article of the materia medica may do physiologic good may also do as great or greater harm."—*Jour. Am. Med. Association.*

The Accuracy of European Retinoscopy.—Chicago, Nov. 1, 1902.—To the Editor: In the *Journal* of Nov. 1, 1902, page 1107, Dr. J. M. Gould, of Philadelphia, uses the following language: "That there is probably not an 'ophthalmic surgeon' in all Europe who can use this method (retinoscopy) with accuracy, shows how far we are as a profession from knowing our science, practicing our art or doing our duty."

I admire Dr. Gould in all his scientific work and can follow his enthusiasm wherever it may lead, but I cannot pass uncorrected such language from the editor of *American Medicine*, who has always advocated accuracy in language and diagnosis. To commit such an unpardonable sin of ignorance and unwarranted discourtesy to foreign confreres, is to belittle his own argument. I have recently had the pleasure of a rather extensive tour through some of the best of Germany University hospitals, and in nearly every clinic I saw retinoscopy practiced as a routine method, and instructions given to students by competent assistants in refraction of this method as a guide. Recent German periodic literature has numerous examples and illustrations of the method of teaching retinoscopy. At the Heidelberg Congress (August, 1902) Pflüger of Berne presented for approval the most elaborate apparatus I ever saw, and stated that it was only after use in his own clinic that he brought it to our notice.

In one private hospital—not belonging to a university and not used for teaching—the resident oculist spent over an hour a day in his dark room with the retinoscope estimating the refraction of the patients.

I have no doubt that the accuracy of these men would meet Dr. Gould's approval. Germans have long ceased to belittle the work of Americans, and we must avoid the error of supposing that what is done well here is therefore ignored or done ill there.

103 State street.

ALBERT B. HALE, M. D.

Comment by Dr. Gould.—PHILADELPHIA, Nov. 6, 1902.—To the Editor: In reference to the courteous note of Dr. Hale I would say that in my opinion:

1. The best method of retinoscopy, when carried out by the most expert, is not trustworthy when subjective methods are possible with intelligent people.

2. No method of retinoscopy is accurate, not even the best one, except under cycloplegia. The Germans do not use cycloplegia.

3. The only use for retinoscopy advocated in my paper was for children. The Germans do not refract little children of from 2 to 6 years of age.

4. The great value of refraction is to diagnose and correct astigmatism. The Germans do not diagnose, correct or care for astigmatism, at least in those minor degrees, which produce the greatest eyestrain.

5. The method of retinoscopy used by the Germans, is the old-fashioned one of Cuignet, which is utterly inaccurate and untrustworthy. The new method of Thorington, Jackson and other Philadelphia oculists is unknown, and their books untranslated in German.

6. It is not a question of "discourtesy" or "belittling." It is simply one of accuracy in statements. Mine were, and remain, absolutely true.

GEO. M. GOULD.

—Jour. Amer. Med. Association.

Trachoma in the United States.—Because of the relative frequency of trachoma in the countries of the Orient and Southern Europe, we have perhaps been accustomed to attach less importance than we should to the comparatively few cases in this country. Attention has been called to the danger of this spreading disease in this country by allowing immigrants who are affected with the disease to come here. Wilder has pointed out that there are already large numbers of cases of trachoma in the United States, and he has especially investigated the prevalence of the disease in Illinois. In the Illinois Institute for the Blind at Jacksonville, 9.09 per cent. of the 451 pupils in attendance were totally blind from trachoma. As a cause of blindness trachoma was second only to blennorrhœa neonatorum, which was responsible for 17.25 per cent. of the total number of cases of blindness. At the Illinois Charitable Eye and Ear Infirmary, 5.6 per cent. of the cases treated are cases of trachoma. In the large hospitals for eye and ear diseases in the eastern part of the United States, the proportion of trachoma cases is smaller, varying from 0.4 per cent. in the Massachusetts Charitable Eye and Ear Infirmary to 4.9 per cent. in the New York Eye and Ear Infirmary. In New York the larger proportion is probably explained by the numbers of poor foreigners living in the tenement districts. On the contrary, in the Illinois Eye and Ear Infirmary the cases come largely from the rural districts and are of American birth. Wilder found the disease most prevalent in the southern part of the state, and he believes that it is increasing in prevalence. The actual cause of the disease is not certainly known but the infection is apparently usually due to either direct or indirect contact with previous cases. The vehicles of the infection in many cases are supposed to be sponges, wash clothes, basins, towels, etc. The most favorable conditions for the dissemination of the disease are furnished by intimate association of the infected

persons with the healthy, together with neglect of the ordinary principles of hygiene and cleanliness. If certain precautions are taken there need never be any spread of the disease to healthy persons living about infected ones. It, like gonorrheal ophthalmia, is a preventable disease. The most important thing to accomplish in the prophylaxis of the disease is to impress on the patient or his patients the way in which he is dangerous to others, and to teach them how these dangers may best be counteracted. Instructions by physicians of the importance of care to prevent direct contact with the secretions from diseased eyes, and indirect contact through the medium of towels, sponges, etc., must be principally relied on to stamp out this disease in which so much can be done to prevent, but so little often to cure.—*Jour. Am. Med. Association.*

It may surprise the ophthalmic surgeons as it did me to note the amount of work done by the railroads of the United States in the matter of examination of the sight and hearing of railroad employees. Circular No. 437, accompanying report of committee on Safety Appliances of the American Railway Association dated March 20, 1902, is a book of 140 pp. The replies may be summarized as follows:

Examination as to education:

89 roads examine as to education.

37 roads do not examine as to education.

2 roads do not state whether or not they examine as to education.

Examination as to age:

94 roads restricts the age of those entering their service.

23 roads do not restrict the age of those entering their service.

11 roads do not state whether or not they restrict the age of those entering their service.

Examination as to physical conditions

67 roads examine as to physical condition.

59 roads do not examine as to physical condition.

2 roads do not state whether or not they examine as to physical condition.

Examination as to strength:

5 roads examine as to strength.

121 roads do not examine as to strength.

2 roads do not state whether or not they examine as to strength.

Examination as to stature:

32 roads examine as to stature.

94 roads do not examine as to stature.

2 roads do not state whether or not they examine as to stature.

Examination as to vision:

80 roads examine as to acuteness of vision and field of vision.

5 roads examine as to acuteness of vision only.

1 road examines as to field of vision only.

40 roads do not examine as to vision.

2 roads do not state whether or not they examine as to vision.

Examination as to color perception:

93 roads examine as to color perception.

33 roads do not examine as to color perception.

2 roads do not state whether or not they examine as to color perception.

Examination as to hearing:

85 roads examine as to hearing.

41 roads do not examine as to hearing.

2 roads do not state whether or not they examine as to hearing.

The examination as to sight and hearing is in some cases that recommended by Allport, Thompson, Williams and of the American Medical Association Committee composed of Würdemann, Jackson and Connor. A conference of the latter committee is being arranged with the American Railway Association Committee, the outcome of which, it is hoped, will be uniformity of system and further safety of the traveling public, railway employes and railway property.

H. V. W.

The Role of Toxins in Inflammatory Processes. (Migratory Ophthalmia)—The time has probably arrived when the pathologist should insist that the professional gaze shall no longer be directed to pathogenic bacteria as the sole agent in the production of inflammation. For many years we have known that infective alterations in the tissue are not always to be explained by the presence of bacteria, although it is also well established that the initial disturbance is very frequently due to microbic invasion. One of these numerous instances is found in migratory ophthalmia. This example is chosen because it well exemplifies the progress made in very recent times in the domain of bacteriology. The experiments of Harold Gifford, Deutschmann and others have clearly shown that the path of infection in "sympathetic" ophthalmia is along the vaginal canals (and other lymph spaces) of the optic nerve, from the injured and infected eye to the chiasm, thence, by way of the opposite nerve, to the "sympathizing" eye—but in the great majority of instances where an examination of the uninjured eye was made, no bacteria whatever were discovered. The sympathizing eye was generally found to be "sterile." This fact was variously interpreted by those whose faith in the germ theory of disease was still unshaken. The microbes were destroyed, they said, before the examinations had been made, but after they had reached the second eye and, in some mysterious way, had accomplished their purpose of setting up in it destructive changes closely resembling those seen in the primary lesion. Other observers, feeling this negative evidence insufficient, fell back on the old hypothesis that furnished the early name to the disease, viz., that the irritation of the sympathetic (ciliary) nerves in the injured eye was sufficient to induce a similar form of inflammation in the fellow eye. Those who retained this belief and who, in confirmation of their contention, occasionally found alterations in the ciliary nerve of the sympathizing eye, failed to explain why migratory ophthalmia is rarely encountered except in penetrating wounds of the eye, and why it is particularly to be feared in infected wounds of the prin-

cipal lymphatic area of the interior of the globe—the region of the ciliary body.

We are now well aware that the second eye is, in all likelihood, poisoned by the toxins excreted by pathogenic bacteria introduced into the “exciting” eye. Doubtless the time is not far distant when chemical reagents (and not the microscope hitherto relied on) will not only demonstrate the presence of these alkaloidal poisons in the “sympathizing” eye, but will reveal the name of the bacterium or bacteria that originally furnished them. This probability as well as other questions regarding the part played by toxins in the production of inflammation, has relatively, been little discussed. Strange to say, also, among the numerous elaborate, exhaustive and original investigation in bacteriology comparatively little has been done for what might be called bacterial toxicology. A sufficient reason for this lies, perhaps, in the marked instability of the toxins, their complex composition, the ease with which they form new combinations and the obstacles that oppose their insolation or classification. With few exceptions we have no reliable chemical tests for them, and have mostly to rely on their biologic reaction and relations.

No better exposition of the part played by toxins in inflammatory lesions has so far been published than the essay to which was quite lately awarded the Boylston prize. This was prepared by Dr. Robert Randolph, who took as his experimental territory the rabbit's eye, using on it the following bacteria and their toxins: the *Gonococcus*, *Koch-Weeks bacillus*, *Bacillus diphtherie*, *Staphylococcus aureus*, *Pneumococcus*, *Micrococcus epidermidis albus*, *Streptococcus pyogenes*, *Bacillus coli communis* and the *Bacillus xerosis*. Randolph reminds us that experiments with the three bacteria first mentioned, as well as with the Morax-Axenfeld diplobacillus, are best with many difficulties because they produce little or no reaction in the conjunctiva of animals, inasmuch as that membrane does not furnish a proper soil for their growth.

The work is divided into four parts; first, the study of the effect produced by toxins when they are instilled into conjunctival sac; second, the result following their infection beneath and into the tissues of the conjunctiva; third, the effect produced by their introduction into the anterior chamber, and fourth, as an adjunct to or as a complementary study of the foregoing, the bacteriology of the normal conjunctiva of the rabbit, based on an examination of forty-seven cases. Forty experiments, recorded under the first heading, demonstrate that mere contact of bacterial toxins with the normal conjunctiva of the rabbit produces no local inflammation or other injurious effects on that animal. Randolph justly claims that his experiments are the first to demonstrate that, alkaloidal and many other poisons, these chemically undefined toxins, excreted by bacterial cells, in common with similar poisons produced by certain cells of the higher order of plants, notably ricin and abrin and of some animals, snake venom for example, are as a rule, incapable of absorption by intact mucous surface. They demonstrate how very important it is to preserve the epithelial integrity of absorbing

membranes against those poisonous agents that lie in wait to invade the organs they cover and protect. He does not attempt to prove or disprove Ehrlich's "side chain" theory of infection, but he does assert that the primary and essential damage to the rabbit's conjunctiva, in the presence of pathogenic bacteria and toxins, is produced by the latter. If the bacteria are secondarily active during the infective process it is because the soil has already been prepared for them by the changes first wrought in the cells and tissues by the toxins. These contentions are further fortified by the numerous experiments included under sections 2 and 3. Randolph is able to show that bacterial filtrates from both old and young cultures contain irritative poisons that promptly set up local inflammatory changes when injected into the substance of the conjunctival mucous membrane. This is especially true of the toxins secreted by the gonococcus, the colon bacillus, the diphtheria bacillus and by all the pyogenic cocci. On the other hand, control injections of the un inoculated culture media, in larger doses, produces no effect.

It was not surprising to find, after the result obtained by intraconjunctival injection of the toxins, that unequivocal reactions follow their introduction into the anterior chamber of the eye. Filtrates were employed in these experiments, not only from bacterial cultures already known to produce powerful toxins, but also from some others not before shown, by the biologic tests, to secrete active, soluble toxins. In every instance Randolph was able to demonstrate that the intraocular (especially the intraconjunctival) reaction is more delicate than usual antiserum or other biologic test in determining the presence or infective quality of the various toxins. That the toxins concerned are not simply the "bacterio-proteins" of Buchner, derived from macerated and degenerated cells, is proved by the use of young cultures only. The conjunctival sac of the rabbit's eye, as in the human organ, was found to harbor numerous bacteria, pathogenic and harmless, and there is reason to believe that both in man and in the lower animals these vary from time to time as to number and pathogenic quality.

The "practical" conclusion to be drawn from this work has long been known to us; we are comparatively safe from microbial invasion as long as the protective epithelium that covers our bodies and lines our canals remains intact. For example, mere rubbing of an eye into which a cinder or other foreign body has flown may result in its destruction from spreading ulcers of the cornea due to infection of the abraded spot from other-wise harmless colonines of the pneumococcus. May not this statement also hold good of bacteria in pulmonary, intestinal genito-urinary tracts? On the other hand, the precise character of the infective injury and our knowledge of the agents that produces it are more clearly defined than before from the painstaking investigations of Randolph.—*Jour. A. M. A.*, Dec. 13, 1902, Editorial by Casey A. Wood.

Punishing People for Being Sick.—All England has been indignant at the crime and at the insufficient punishment of a mother, who punished her daughter brutally for "a bad habit." It is said that

this "bad habit" was incontinence of urine—which the punishment probably and naturally increased. Almost every one can remember such an illustration of punishing children for being ill which occurred in his neighborhood or family during his childhood. The fact arouses the thought that the old time punishments of the insane, of the aged, etc., are by no means past. To every oculist's office are frequently brought in pitiable condition, victims of stupid school-teachers who are still often punishing children for the astigmatism, myopia, or hyperopia which has prevented them from seeing figures on the blackboard, or from studying diligently, or from being as bright-minded as the teacher wishes. We know of one railway superintendent who punishes his men who are growing presbyopic by discharging them if they wear glasses. One wonders if the detestable supersession of the evil eye, and horrible punishment inflicted on its supposed possessor, has not arisen because of strabismus.—*Amer. Med.*

At the Eight Annual meeting of the Western Ophthalmologic and Oto-Laryngologic Association to be Held in Indianapolis, Ind., April 9-10-11, 1903, The following Ophthalmic papers will appear on the Program:

1. "Episcleritis," Dr. Adolf Alt, St. Louis, Mo.
2. "Keratoconus, Etiology, Early Diagnosis and Treatment," Dr. J. A. L. Bradfield, LaCrosse, Wis.
3. "Some Experiences in the Operation for Complicated Cataract," Dr. J. E. Brown, Columbus, O.
4. "Hysterical Amblyopia, with Report of Cases," Dr. A. E. Bulson, Jr., Ft. Wayne, Ind.
5. "Clinical Experiences in the Management of Phoria Patients: Failures and Successes," Dr. J. Elliot Colburn, Chicago, Ill.
6. "Degenerate Ocular Changes Resulting from Consanguinity of Parents," Dr. Lee Wallace Dean, Iowa City, Ia.

Preliminary Program. Section on Ophthalmology American Medical Association. Meeting in New Orleans, La., May 5 to 8, 1903:

- Vernal Conjunctivitis. Wm. Campbell Posey, Philadelphia.
- Relapsing Iritis, Chronic Iritis and Their Treatment, and the Value of Iridectomy. J. M. Ray, Louisville, Ky.
- Calcareous Degeneration of Corneal Cicatrices. H. Moulton, Ft. Smith, Ark.
- Experimental Study on Some Methods of Combatting Post-operative Infection of the Anterior Segment of the Globe. E. C. Ellett, Memphis, Tenn.
- Subconjunctival Medication, with Reference to the Use of Salt Sugar Solution in Acute Affections of the Anterior Portions of the Globe. H. McI. Morton, Minneapolis, Minn.
- Ocular Complications of Brights. Louis Stricker, Cincinnati, Ohio.
- Albuminuric Retinitis and the Decapsulation of the Kidney. Geo. F. Suker, Chicago.

Address. Prof. Uhthoff, Breslau.

Paper. A. A. Hubbell, Buffalo, N. Y.

Ocular Inco-ordination and Cerebral Reflexes. F. Park Lewis, Buffalo; N. Y.

The Voluntary and Involuntary Brain Centers Controlling the Ocular Muscles. G. C. Savage, Nashville, Tenn.

Remarks on the Horopter. Geo. T. Stevens, New York City.

Symposium on the Influences of the Cervical Sympathetic on the Eyes.

(1). Experimental Researches Regarding the Influence of the Cervical Sympathetic on the Eye. Geo. E. Schweinitz, Philadelphia.

(2). The Influence of Resection of the Superior Ganglion of the Cervical Sympathetic in Glaucoma. W. H. Wilder, Chicago.

(3). Influence of Resection of the Cervical Sympathetic in Optic Nerve Atrophy, Hydrophthalmus and Exophthalmic Goitre. James Moores Ball, St. Louis.

(4). Pathology of the Cervical Sympathetic. John E. Weeks, New York City.

Arterio-Sclerosis (Endarteritis) and Its Bearing upon Retinal and Chorioidal Lesions. Chas. Stedman Bull, New York City.

Study of the Nerve Head in Relation to Certain Other Fundus Anomalies. Chas. H. Beard, Chicago.

Retinal Diseases Circumscribed in the Region of the Macula. Henry Gradle, Chicago.

Pathologic Exhibit. Address by Chairman Casey A. Wood.

Bacteriological Exhibit, prepared by a Committee consisting of R. A. Randolph, Baltimore, Md.; Brown Pusey, Chicago, and Edgar Thomson. Address by Chairman R. A. Randolph.

Paper (same subject). Brown Pusey, Chicago.

The Essentials and Unessentials of Ophthalmic Asepsis. Harold Gifford, Omaha, Neb.

Development of the Fusion Center in the Treatment of Strabismus. Nelson M. Black, Milwaukee, Wis.

A Set of Charts for the Stereoscope, to be Used for an Amblyopic Eye and for Treatment of Squint. Albert B. Hale, Chicago.

A Group of Physiological Phenomena Associated with Eye-strain. Samuel D. Risley, Philadelphia.

Skiascopy as a Method of Precision. Edward Jackson, Denver, Col.

Treatment of Eye Complications in Smallpox. A. R. Baker, Cleveland, O.

Skin Grafting on the Eyelids. Oscar Dodd, Chicago.

A New Feature in the Operation for Cicatricial Ectropion of the Lower Lid. F. C. Hotz, Chicago.

Entropion and the Operations Employed for Its Relief. John O. McReynolds, Dallas, Texas.

Subtropical Trachoma, with Special Reference to a New Therapeutic Agent. Ruffin A. Wright, Mobile, Ala.

The Action of Adrenalin in Acute Conjunctival Inflammation. Louis J. Lautenbach, Philadelphia.

Cramp of Ciliary Muscle Due to Eye-strain, J. W. Wright, Columbus, O.

Sympathetic Ophthalmia as the Result of Trauma in the Ciliary Region, John Sabert Mott, Kansas City, Mo.

Traumatic Lesions of the Ocular Adnexa; with Report of a Case of Contused Wound of the Eyebrow Resulting in Complete Monocular Blindness Unaccompanied by Ophthalmoscopic Changes. Ellett O. Sisson, Keokuk, Ia.

Our Present Knowledge of the Cerebral Centers of the Eye. C. Barck, St. Louis.

Extraction of the Crystalline Lens in High Myopia. H. V. Würdemann and Nelson M. Black, Milwaukee, Wis.

The Management of Myopia. J. H. Claiborne, Jr., New York City.

Suggestions on the Pathogenesis of Glaucoma. N. J. Hepburn, New York City.

The New Orleans meeting of the Ophthalmic Section promises to be one of great interest, and there is every prospect of a large attendance. There will be a pathologic exhibit and a bacteriologic exhibit in rooms adjoining the meeting hall of the Section. There will also be at hand for the use of the members a demonstrating ophthalmoscope. Through the courtesy of Dr. Bruns, the members are invited to visit the celebrated New Orleans Eye, Ear, Nose and Throat Hospital. Those who were present at the last meeting and had the pleasure of hearing Prof. Haab will appreciate the opportunity of hearing Prof. Uhthoff, of Breslau, whose reputation is sufficient guaranty of an interesting and instructive address upon some subject pertaining to ophthalmology.

FRANK C. TODD, Minneapolis,

JOHN E. WEEKS, New York City,

Secretary.

Chairman,

BOOK NOTICES.

Dangerous Trades.

The Historical, Social and Legal Aspects of Industrial Occupations as Affecting Health, by a Number of Experts: 89 illustrations; 38 Authors; 60 Essays; 891 pp. Price, £1 10s. \$7.50. Published by John Murray, Albemarle St., London, 1902.)

Edited by OLIVER THOMAS, M. A.; M. D.: F. R. C. P.: Medical Expert on the White Lead, Dangerous Trades, Pottery and Lucifer Match Committees of the Home Office; Professor of Physiology, University of Durham; Physician to the Royal Infirmary, Newcastle-upon-Tyne.

"The commencement of the Twentieth Century finds us discussing problems and elaborating plans for the amelioration of the life of the people. The last few years have witnessed an unexampled awakening of the public to a sense of its responsibility in regard to conditions of labor and unhealthy trades. The question is not should men and women work, but how do particular trades affect individuals, physically and morally?"

These opening sentences show the *raison d'être* for this work, and with the elucidation of these problems are given plans for amelioration of the physical and mental lot of laborers in various fields which are now or which may be put in force. The Workmen's Compensation Act was promulgated in 1898, but it cannot be said that it has had any material influence upon the reduction of reported cases of accident, probably because more accident cases are now reported than previously. Ought dangerous trades be brought under this act? which now only allows for accidents and not for diseases contracted in the work.

We in America have not yet reached this stage of paternalistic legislation. The time will surely come, when forced by the Workmen's Unions, this subject will come up for action. "Every disease recognized as particularly frequent in a profession ought to be considered as an industrial disease, to the extent that it is clearly due to the risks of the trade in which a person is engaged." Diseases may be either directly or indirectly due to the risks of the trade.

The subject has been under consideration even from the time of the great civilizations of antiquity, when Pliny wrote of certain maladies as the "diseases of slaves." And at this date in England has ultimated in the Trades Act of 1898. The first governmental work being the investigations of the sanitary commissions of 1843-5 and 1869-71.

The author of this branch of the subject states that England is lagging behind the legislation of Germany, France, Austria, Switzerland and even Russia. In such paternalistic legislation other countries are indeed, far ahead of the United States of America:

The personal sovereignty of the American citizen has long ago

lifted him out of the state and has protected him from the fate of the helot, the slave and the bondsman of ancient times, and his condition in this free country is a contrast to that of the poverty pressed employe of Europe, even at the present day. The condition of some of our miners, factory employees and sweat-shop laborers, in this country, approaches somewhat those of Europe and is certainly remediable by enforcement of existing laws without the necessity of old world legislation of this type.

The authors of the essays are well known specialists in this economic field. Among other subjects the work deals with infant mortality and factory labor, child labor and home work; the physiology and pathology of work and fatigue with mortality of occupations are thoroughly discussed. Then the several authors take up the various occupations, such as, the soldiers, sailors, marines and railway services, agriculture, the lead and metal workers, phosphorous, benzine, acetylene and chemical workers and other well known dangerous or toxic trades, diseases due to dust, poor air, increased or diminished atmospheric pressure and concussion. The chapter on Eye Diseases and Injuries in relation to industrial occupations by Simeon Snell, who has done so much for the elucidation of this subject and the amelioration of blindness in eye defects arising from certain trades, is of particular interest.

The illustrations are mainly well made photographic reproductions. The appendix and index are most complete; the typography and binding well done. The book is heartily recommended to all progressive physicians, particularly to practitioners in industrial and mining communities, which furnish the larger proportion of diseases and accidents described in this volume.

H. V. WÜRDEMANN.

Stereoscopic Pictures for Squinting Persons.

Dr. Emil Hegg. Bern, 2nd enlarged edition. Bern, Schmid and Francke, 1902. F. 3.80 or \$0.75.

His collection contains 85 plates, partly in black, partly colored. Besides exceeding all others of similar kind in number it has some special features. The lateral distances of the half pictures vary, and thus, with the forward and back movements of the plates in the stereoscope, allow of a gradation of the exercises in order to obtain the normal positions of the eyes. They are arranged in series and Table A of orientation shows by a gauge, which series, with regard to the lateral distances, has to be commenced with. Then the pictures differ, as to easy or more or less difficult fusion, by the difference in the sizes of the congruent nuclei stimulating the fusion. There are quite a number of small pictures which require a much more exact fusion than larger ones. The chief advantage of H.'s plates, however, lies in the very rich assortment of pictures of three dimensions, as the perception of three dimensions must be the main object of all stereoscopic exercises.

The second edition, which became necessary after 3 years, has been enlarged and improved. In series IV the pictures for the

squinting (and weaker) eyes have been given greater contrast in order to facilitate their perception, 4 reproductions of stereoscopic photographs are added, and plate B, consisting of 2 black discs to stimulate simultaneous vision of both eyes in cases of total anopsia of one eye during the act of binocular fixation. The explanatory text is in German and French. Although some of the figures may be too complicated for smaller children the abundance of the collection will satisfy any demand. C. ZIMMERMANN.

On the Theory of Skiascopy, the Skiascopic Determination of Refraction and My Electric Skiascopophthalmometer, with Remarks on the Line of Accommodation and the Spheric Aberration of the Eye.

Dr. Hugo Wolff, Berlin, 61 pages with 12 figures in text, 2 plates and 1 table. Berlin, 1903. S. Karger.

W. deduces the theoretical explanation of the skiascopic phenomena from the theory of the optical instruments, by considering the eyes of the observer and the patient as an optical system. As to the action of diaphragms and images, the law of von Helmholtz and Abbe obtains, viz: in every image the focusing pencil of rays in the region of the object is bordered by a diaphragm whose picture limits the pencil of rays in the region of the image, so that no ray can be emitted from the latter (exit pupil, Abbe) which has not entered it through the former (entrance pupil, Abbe). Then W. dwells on the difference of the ophthalmoscopic and skiascopic visual fields, the central dark disc, the theory of the oblique border of the shadows, the construction of the skiascopic way of rays in reality, the accommodation of the observer, the theory of the neutral line, and gives a description of his apparatus, the examination at labile distances, the use of the electric skiascopophthalmometer as spherometer, and a table of the results of his examinations of 92 cases. W. considers skiascopy as one of the most exact ophthalmometric methods, and the monograph deserves a thorough study.

C. ZIMMERMANN.

Encyclopedia of Ophthalmology.

Encyklopaedie der Augenheilkunde, Herausgegeben von Prof. Dr. O. Schwarz, Leipzig. (Edited with 54 Collaborators by O. Schwarz.) Leipzig, F. C. W. Vogel, 1902. M. 28, \$7.00.

The Encyclopedia of Ophthalmology forms a volume of Vogel's Medical Special Encyclopedias, of which so far those of otology, cutaneous and venereal diseases, obstetrics and gynecology, surgery, and hygiene have appeared. Its purpose is to be, in lexicographic form, a practical handbook of quick ready reference on all subjects of ophthalmology, special as well as in relation to other branches of medicine, for the general practitioner and the oculist. The subject matter is distributed in 2,000 separate articles, and besides 1,000 subjects refer to the former. According to their practical importance some parts are represented more fully, e. g., the operations,

therapeutic and special pharmacological themata, and also physiological questions, especially physiological optics, are very clearly discussed. Whenever it is necessary for better understanding illustrations are added and short bibliographies of the most important literature. The collaborators are from the ranks of the most competent and renowned ophthalmologists, and their names are found below their respective articles. The 7 numbers so far published (there will be 14 altogether) give ample proof how well the proposed task has been done. Especial credit is also due to the publisher for the handsome getting up of the work with regard to paper, print and arrangement. Thus a novel book has been produced which will be found very useful, as it presents modern ophthalmology in a most convenient form. C. ZIMMERMANN.

Relation of General and Organic Diseases to Changes and Affections of the Visual Organ.

Dr. A. Groenouw, Professor, Breslau. Graefe-Saemisch. Handbuch der gesamten Augenheilkunde; 2nd, entirely new edition, with illustrations, No. 40 Leipzig, 1902. W. Engelmann. Subscription price 2 M., \$0.50.

This number is the continuation of Nos. 35 to 38, reviewed in the ANNALS of April 1902, and contains, first, the description of ocular affections in septicemia. In the paragraph on metastatic ophthalmia the author follows the elaborate investigations of Axenfeld in von Graefe's Arch., adding to the statistics of the latter 166 new cases. In the author's opinion quite a number of cases of metastatic ophthalmia, attributed to various infectious diseases, belong to the category of kryptogenetic septico-pyemia, which may present a clinical aspect very similar to the former. Affections of the lids in anthrax (carbuncle and edema) may heal without deleterious consequences or may leave considerable defects by gangrene. The differentiation of lid affections due to syphilis and tuberculosis must be made by bacteriological examinations; perhaps injections of mallein will be useful also in man. Aetionomyosis occurs in the conjunctiva and the tear ducts, in which it may live for years without causing abscesses or fistulae, as it generally does in other regions. In trichinosis mydriasis, with or without paralysis of accommodation, is to be attributed to toxins since trichinae do not invade the smooth muscular fibres.

The last paragraphs deal with the ocular affections in measles, scarlet fever, smallpox, vaccinia, with an illustration of keratitis profunda post-vaccinosa, varicellae and erysipelas. Like the preceding also these chapters are exhaustively treated so that they give thorough information, even in cases of rather rare occurrence, in which the value of such an encyclopedic work, as the great handbook of Graefe-Saemisch is especially appreciated.

C. ZIMMERMANN,

Etiology and Morbid Anatomy of the Ocular Palsies.

St. Bernheimer, Prof., Innsbruck, Graefe-Saemisch, *Handbuch der gesamten Augenheilkunde*, 2nd entirely new edition, No. 41. Leipzig, W. Engleemann, 1902.

We reviewed the first part in the *ANNALS* of October, 1902. This No. concludes the etiology of the basal paralyses. Changes of the bloodvessels, as sclerosis, miliary and other aneurysmata, luic affections in the brain substance, as well as at the base, may, owing to the anatomical conditions mentioned, lead to compressions and inflammations of the ocular nerves, more rarely to hemorrhages, and entail various functional disturbances. Those forms of meningitis, associated with considerable exudations, are especially apt to cause basal ocular palsies, as tuberculous, purulent and cerebro-spinal meningitis. In syphilitic, particularly gummous meningitis, the stems of the nerves become atrophic from the pressure of the gummous proliferation, or are involved in the gummous process themselves and thus totally degenerate. Apparently the syphilitic irritation stimulates the connective tissue of the nerves to proliferation. The 3rd nerve is pre-eminently affected. Tumors of the base, chiefly of the hypophysis, generally cause secondary atrophy of the ocular nerves by direct pressure or indirectly by the increased volume of parts of the brain next to the base. B. emphasizes again, that a basal paralysis may be partial, as autopsies proved that certain forms of tumors, tough, inspissated exudations and proliferations of the periosteum at the base, dura mater, superior orbital fissure may act on the exposed 3rd nerve (and finally also on the 6th and ophthalmic branch of the 5th nerve) in such a manner that all or only a portion of the branches are paralysed. Therelapsing periodic palsies are also classified under the basal lesions.

B.'s investigations make it probable that the fibres of the sphincter take an axial course in the stem of the 3rd nerve, so that an isolated interior or exterior paralysis would be due to a partial axial or periaxial neuritis, analogous to the conditions in the optic nerve in central intoxication amblyopia. From all this transpires that the kind of paralysis of the oculomotor nerve alone is of no differential diagnostic value as to the cerebral or extra-cerebral seat of the lesion. Only the exact study of the etiology, commencement, course of the paralysis and of the concomitant symptoms frequently will help to elucidate the nature of the process, the last anatomical cause of the lesion.

The orbital palsies are due to secondary changes of the ocular nerves or muscles, caused mechanically by displacement by tumors of the orbit or the neighboring cavities, inflammatory or purulent processes or injuries. Congenital defects of the motor apparatus may be owing to aplasia of the nuclei or anomalies of the muscles and their insertions. The subject is very well and clearly treated and an extensive bibliography appended. C. ZIMMERMANN.

Anomalies of Refraction and Accommodation with Introductory Exposition of Dioptrics of the Eye.

Dr. Carl Hess, Professor, Wurzburg. With 105 figures in the text. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde, 2nd, entirely new, edition. Nos. 41 to 47. Leipzig, W. Engelmann, 1902. Subscription price 14 M. \$3.50. Single price 21 M. \$5.25.

The first edition (1880) contained only the general part of the anomalies of refraction and accommodation by the late Prof. Nagel, the special part never appeared. In 1888 a new edition of the famous work of Donders on the same subject was published by O. Becker, but it was only a reprint of the first edition of 1866, so that since that time nothing has appeared of the kind, although considerable work had been done in this field. Therefore this new book by such a competent author as Prof. Hess will be cheerfully welcomed. It is a stately volume of 523 pages and a most elaborate work. On account of the abundance of its contents, presented in clear and pleasant language, it is impossible here to enter into details. Section 1 contains the principals of geometrical optics as far as necessary for the understanding of the dioptries of the eye, with a paragraph on spherical aberration and astigmatism. Then follows sections on the constant values of the human eye, the schematic and reduced eye, on the influence of the pupil and circles of diffusion, monochromatic and chromatic aberrations, lenses and spectacles, emmetropia ametropia, accommodation to which H. has contributed considerable original work, presbyopia, paralysis of accommodation. Section 8 on myopia comprises 80 pages, and also contains a chapter on the operative treatment of myopia. Then come the chapters on hypermetropia, aphakia, astigmatism, including keratoconus and lenticonus, and on vision with both eyes from physiological and pathological aspects. A superficial perusal of single chapters at once conveys the impression of the great knowledge, care and judgment the author has devoted to this work and thus has created a most valuable and exceedingly useful and modern book on this important subject. C. ZIMMERMANN.

Operations on the Eye.

Prof. H. Snellen, Utrecht. Translated from the Dutch by Dr. M. Hillemanns. Graefe-Saemisch Handbuch der gesamten Augenheilkunde, 2nd, entirely new, edition, with illustrations. Nos. 48 and 49. Leipzig, 1902, W. Engelmann. Subscription price, 4 M. \$1.00.

In the first edition this chapter was written by V. Arlt. In none has such a change taken place within the last 25 years. It is of special value that the new edition is presented by an author who has not only witnessed those changes but who also is himself a famous operator and commands an unusual experience. He follows the general plan of von Arlt and commences with the operations on the eyeball, after some general considerations on narcosis, local an-

esthesia, sterilization and asepsis, mydriatics and myotics, objective and functional examinations of the eye, general condition of the patient, operating room and illumination, the operator, the instruments, dressing and after-treatment. In Section 2 the cataract operations are described, but only the modern ones. Reclination and depression, e. g., are only briefly mentioned and, for their historical interest, the reader is referred to the first edition. The gradual development of the cataract extraction, illustrated by drawings, is more minutely described. Then follow discussion, linear extraction and dilaceration and an entirely new chapter on the removal of the lens in high myopia. S. quotes here the observations of Pflüger, von Hippel, Sattler, Vacher and Fuchs, and the statistics of P. Muntendam, over 891 cases, which are reprinted in tabular form. He emphasizes that our experience is still of too recent date, so that many questions as to the prognosis cannot be answered until numerous eyes, operated upon, shall have been observed for a long time.

In Section 4, iridectomy is described, and in Section 6, the operative treatment of glaucoma. S. considers the use of miotics and pressure bandage necessary after operation, no matter whether sclerotomy or iridectomy have been performed. A paragraph is devoted to the action of miotics and mydriatics and to the influence of the supreme sympathetic ganglion on intraocular pressure, with due consideration of its extirpation in glaucoma.

Under the chapter staphyloma, also buphthalmus, keratoglobus and keratoconus are described. S. reported some cases of keratoconus in which V has been greatly improved by the use of stenopeic spectacles. The numbers end with a description of enucleation and exenteration of the eyeball and prothesis, in the perfection of which S. himself took an active interest, in coöperation with Messrs. Müller, in Wiesbaden, who now manufacture mostly the new so-called reform eyes. The last paragraph deals with the treatment of sclerocorneal wounds and their covering with conjunctival flaps.

The description of each operation is preceded by short historical remarks, in which the principal progress of our knowledge is chiefly set forth. Although we might have wished entering into more detail on some important places, as, e. g., accidents in cataract operations, so very important for the beginner to be prepared for, the subject is, so far, treated masterly, in a most fascinating style. It is an excellent addition to the progress of the admirable handbook of Graefe-Saemisch.

C. ZIMMERMANN.

Hermann von Helmholtz.

Leo Koenigsberger, Heidelberg. Volume I. With 3 portraits in heliogravure. Braunschweig. Friedrich Vieweg and Sohn, 1902. Cloth 10 M. \$2.50. Half Morocco 12 M. \$3.00.

We take great pleasure in announcing the appearance of this excellent biography of v. Helmholtz which is of the greatest interest to the whole scientific world and large circles of educated laymen. Ophthalmologists will feel particularly benefitted and rejoiced by

the study of the personal and scientific development of this great man, who inaugurated a new era of our science by his invention of the ophthalmoscope and his admirable hand book of physiological optics. The author says in the preface that personal and scientific relations to Hermann von Helmholtz, existing for many years, and the urgently repeated requests of his late widow, Mrs. Anna von Helmholtz, were for him an incentive to write a biography of the eminent scientist. He was materially supported by the relatives of V. H., especially his daughter, Mrs. Ellen von Siemens and a large number of celebrated scientists and personal friends who placed letters and communications from and to H. at his disposal. He also had the official papers of H., deposited at the Prussian administration of education, at his command. Thus K. admirably succeeded in giving an extensive picture of the life and the works of the great investigator with thorough conception of his extraordinary scientific importance and the harmonious trend of thought and actions of the human side of this superior man. The book is very handsomely gotten up, one of the heliogravures is made after a daguerrotype of 1848 and one after the portrait by Lenbach of 1876. The present volume concludes with the year 1861 when H. was Professor of Physiology at Heidelberg. The second volume will appear at the commencement of this year.

C. ZIMMERMANN.

A Treatise on Diseases of the Eye, Nose, Throat and Ear, for Students and Practitioners, by Various Authors.

Edited by William Campbell Posey, A. B., M. D., and Jonathan Wright, M. D. Illustrated with 659 engravings, 35 plates in monochrome; published by Lea Bros. & Co., Philadelphia and New York, 1903. Price, in cloth, \$6.00; in sheep, \$7.00.

This excellent text and reference book, gotten up somewhat on the style of the American Text-Book series, combines the diseases of the four special organs (eye, ear, nose and throat) whose anatomical and pathological relations are so close, a thorough knowledge of all is necessary in order to practice one successfully. Pre-supposing a knowledge of the anatomy and physiology of these parts, separate chapters on these subjects have been purposely omitted, but sufficient information is found under the different headings to demonstrate their symptomatology and pathology. One pleasing feature is that the majority of the contributors are American; and, while we do not wish to incense our brethren over the water, an American does like things typically American.

Typographically, the book is excellent, and well illustrated; while there are numerous familiar old woodcuts, the large number of new and original illustrations are refreshing and very instructive. In some cases credit has not been given for illustrations inserted, which will, no doubt, be corrected in the second edition.

The book, in sheep, is a fine volume; but it seems as if the publishers had been a little color blind when the tint of the cloth binding was selected, as it is a "crushed strawberry" with cream trimmings, or, rather, a maroon with white lettering.

Chapter I takes up the "examination of the eye," and Posey has thoroughly covered the subject and has treated the subject of ophthalmoscopy in such a manner as to make it easily comprehensible to the beginner and the general practitioner.

Suter has made the chapter on "physiology of vision" concise, instructive and interesting without going into the dry and somewhat unnecessary descriptive details.

Emmetropia and the varieties of ametropia, together with their correction, are thoroughly discussed by Duane in his excellent paper, "Refractive Errors in General." The subheadings:—Symptoms arising from, and methods of examining for, refractive errors; ophthalmoscopy in the determination of the refraction; skiascopy; subjective tests; rules for prescribing and the adjustment of glasses, and the hygienic treatment of refractive errors—make this chapter the most complete and instructive of any so far published.

Casey A. Wood, under the head of "The Motions of the Eyeballs and Their Derangements," has thoroughly gone into the subject of the ocular muscles and given the best methods of testing for and treating their anomalies and pathologic conditions.

Reeve, of Canada, treats of "Diseases of the Orbit, Lacrimal Apparatus and Lids."

In Chapter VI, "Diseases of the Conjunctiva, Cornea and Sclera," Weeks has given the latest findings on the bacteriology and pathologic histology of conjunctivitis and keratitis.

Würdemann has made a most interesting chapter of "Embryology of the Eye, Anomalies, Diseases and Injuries of the Iris, Ciliary body, Chorioid and Vitreous;" the many illustrations colored as well as in black and white, the majority of which are original, add greatly to the paper and make it doubly instructive.

The mention of Gifford's name as the author of the chapter on "Sympathetic Ophthalmia" is sufficient guarantee of its excellence.

"Diseases of the Retina, Optic Nerve, and its Cerebral Origin" is ably and scientifically discussed by T. Holmes Spicer of London.

Ellett's chapter "Diseases of the Crystalline Lens" is beautifully illustrated from preparations made by Dr. E. S. Thomson in the Laboratory of the Manhattan Eye and Ear Hospital.

The subject of "Glaucoma" could have no better collaborator than E. Treacher Collins of London..

"Disturbance of Vision Without Apparent Lesion" is an important subject especially in relation to the revolution taking place in the standard of examinations required by railroads, steamboat companies, etc., and is well handled by Starr.

"The Eye in its Relation to General Diseases" is a chapter which can be appreciated by the general practitioner more than any in the book and a subject some so-called specialists are least familiar with, and Clark has certainly covered the subject completely.

"General Preparation for Operations upon the Eye" is the subject of Veasey's chapter.

Shumway treats of the "Technique of the Bacteriological and Pathological Examinations of the Eye." This includes the preparation of and the method of mounting macroscopical specimens.

The balance of the book is devoted to the nose throat and ear and while equally well edited will not be reviewed in these columns.

NELSON M. BLACK.

217

THE ANNALS OF OPHTHALMOLOGY.

VOL. XII.

APRIL, 1903.

No. 2.

REPORT OF CASES OF EXTENSIVE SYMBLEPHARON AND OF SHRUNKEN AND OBLITERATED CUL DE SACS, RELIEVED BY SKIN GRAFTING. WITH DESCRIPTION OF THE OPERATION.*

By H. W. WOODRUFF, M. D.,

JOLIET, ILL.

PROFESSOR OF OPHTHALMOLOGY IN THE CHICAGO EYE, EAR, NOSE
AND THROAT COLLEGE, AND SURGEON AT THE ILLINOIS
CHARITABLE EYE AND EAR INFIRMARY.

It is not my desire to call your attention at length to the difficulties encountered in operating by the various methods, for the cure of these conditions. Many of you know of them by personal experience. The best modern text books do not speak of any operation which can be relied upon in extensive deformities of this character. Harlan, in Norris and Oliver (Vol. III., p. 130), says: "Close adhesion of the whole surface of the lid to the ball, without cul de sac or canthus, is a most discouraging condition to treat."

Knapp, in the same volume (p. 844), says: "In spite of the numerous attempts which, during the last twenty-five years, have been made to remedy this unfortunate condition by grafting skin or mucous membrane of all possible localities and in all possible manners on the atrophic surfaces, I have not seen either in New York or in my travels

*Read before the Chicago Ophthalmological Society, February 10, 1903, with exhibition of cases.

a single case that had been more than a temporary improvement, including even the cases in which the object aimed at was only to fit a stump for the prothesis of an artificial eye."

Fuchs (p. 119) says: "Cases of extensive symblepharon totale are incurable."

About eighteen months ago, while operating at the Eye and Ear Infirmary on a case of ankyloblepharon, by Sam-

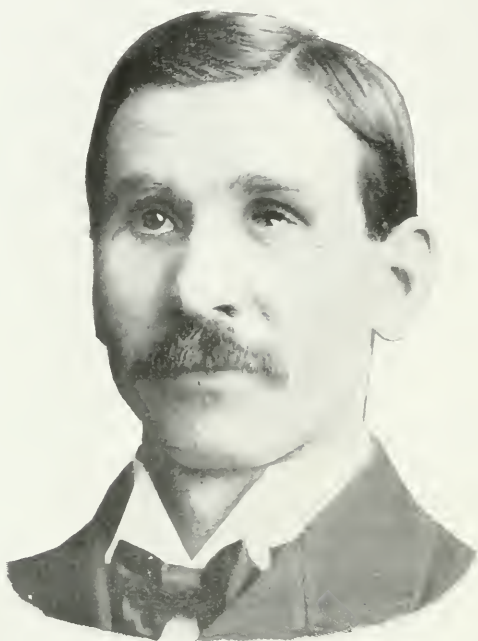


Fig. I.

Case III showing artificial eye worn over the graft.

elsohn's method, namely, the turning of a pedicle skin flap from the lid to cover the denuded conjunctival surface of the other lid, Dr. Henry R. Boettcher suggested to me the use of Thiersch grafts, held in place by lead plates, citing a successful case of his own, operated on by Dr. Hotz by this method. Since then I have operated on six cases, three of symblepharon, and three of shrunken cul de sacs, in which the wearing of an artificial eye was impossible.

The method of operating is as follows: The patient should

be under a general anesthetic, preferably chloroform. The eyebrow and skin about the eye, and the surface from which the graft is to be taken should have been previously thoroughly cleansed with green soap and hot water, washed with alcohol and bandaged. Immediately before the operation is begun the field is freely flushed with boric acid solution. If a pseudopterygium is present, it is first dissected from the cornea, and the lid thoroughly freed from its attachment to the eyeball, and the cul de sac must



Fig. 2.

Case III showing graft ten months old.

be made large in all dimensions. Cicatricial bands should be removed entirely. Bleeding is checked by hot water. A plate is now cut from a sheet of block tin, which will snugly fit into the new-formed cul de sac. The corners are rounded off and the edges smoothed with the scissors or file. If the case be one of symblepharon, and there is danger of the plates rubbing on the cornea, it may be cut out in the center to the extent required. Four holes are made for the sutures, two at the outer and two at the inner angle of the plate, to correspond to the lid margin. A

razor which is known to be in good condition is used for removing a thin layer of skin, about one-third wider and more than three times as long as the plate. In the method known as Thiersch's the transplanted flap includes only the epidermis and superficial layer of the dermis. The graft is best taken from the inner surface of the arm, which is put on the stretch by firm pressure with the hand, and



Fig. 3.

Case VI with symblepharon and pseudopeterygium.

made flat by pressure with the razor while cutting. The graft is transferred at once to the plate, and folded over it with the raw surfaces external. Plate and graft are then pushed into the cul de sac, and sutured to the lid near its margin, tying them over small rolls of gauze. The lids may be sewed together and dressed with gauze, and bandaged in the usual way. Both eyes should be bandaged as long as the plate is in place and absolute quiet maintained.

The plate is removed in four days, and more freedom allowed the patient.

The six cases reported are successive, operated on in the order given.

Case I. Mike S., aged 38, was admitted to the Illinois Eye and Ear Infirmary, Jan. 14, 1901. Four months previously he was burned in the right eye with molten metal, which resulted in a symblepharon of nearly the inner half



Fig. IV.

Case VI showing graft after one month.

of both upper and lower lids, and ankyloblepharon to the same extent. Jan. 18, 1901, Samelsohn's operation was performed on the lower lid. The graft lived and relieved the condition to a slight extent. Feb. 1, 1901, the same operation was performed on the upper lid, with about the same result. The lid margins were freed, but there was not much of a cul de sac at the inner canthus. March 9, 1901, he was operated on by the graft plate method, and

was much improved when discharged, one month later

Case II. Richard W., aged 11, admitted to the Infirmary Aug. 12, 1901. Six years before he was burned in the left eye with lime which resulted in a symblepharon, which covered the lower nasal quadrant of the cornea. He had previously undergone four operations, without relief. He was operated upon by the above-described method, Aug. 19, 1901. The graft was taken from the leg. The result, as shown to-night, eighteen months after the operation, is no return of the symblepharon from shrinking of the graft.

Case III. Frank H. P., aged 32. Admitted to the Infirmary April 9, 1902. Left eye was removed eighteen years ago in Breslau, because of an injury from a shotgun. Since 1894 he has not been able to wear an artificial eye, on account of a shrunken cul de sac. The operation was performed April 14, 1902. This case has been shown to the Society before, about one month after the operation. The case is shown to-night, ten months after the operation, with, I believe, if it is possible, a larger cul de sac than was present one month after the operation. The depth of the cul de sac is 15 mm.

Case IV. Lillian B., aged 9. Admitted Sept., 1902. She lost her left eye when but a few years old. Cause unknown. Both cul de sacs closed by adhesions. The first operation was performed Sept. 29, 1902, on the lower cul de sac. Dec. 1, 1902, the operation was performed on the upper cul de sac. The first operation was a complete success. This case is shown to-night, the lower graft being five months old. The upper was a partial failure, and the operation was repeated Jan. 26, 1903, and I think will give a better result.

Case V. Rena H., aged 21. Admitted to the Infirmary July 17, 1902, for trachoma. She was in the institution when four years of age for removal of the left eye. This case has been in the service of Dr. Wilder, and was referred to me by him to operate for the restoration of both upper and lower cul de sacs, so that she could wear an artificial eye. The upper cul de sac was made Dec. 29, 1902, and the lower Jan. 26, 1903. Both are in good condition at the present time, and have a depth of about 20 mm.

Case VI. Carl J. N. Admitted to the Chicago Eye and Ear College Jan. 8, 1903. The left eye was burned several

months before with hot metal, which resulted in an extensive symblepharon of the lower lid, and a progressive pseudo-ptyerygium, which covered more than the lower half of the cornea. He had had one operation last summer, the grafting of rabbit's conjunctiva, which was without any lasting result, although I believe the graft lived. He was operated Jan. 9, 1903, with thus far a good result. Depth of cul de sac is 15 mm.

CONCLUSIONS.

While in symblepharon this operation cannot be said to leave nothing to be desired, still I believe I am safe in saying it is the best up to date. It relieves the symblepharon permanently. True, the white surface of the graft may be quite noticeable for a long time, and may be objected to by the patient. We also know that skin does not become mucous membrane, still, where we are not able to obtain mucous membrane in sufficient quantity to cover any large extent of surface, we must be content with the material so readily available. The essentials to success accord with the general principles of surgery: Absolute asepsis, complete stasis, approximation of the parts, and rest. However, there are a few special conditions, which, if attended to, will contribute much to your peace of mind, as well as make or mar the good results of the operation. I have spoken of the razor. It should have just left the hands of a person competent to put an edge on it, and it must be of proper length. It is almost impossible to get a good graft with a short razor.

The needles also must be as sharp as if to be used for an advancement operation, so that they will readily puncture the graft and lid with as little pressure as possible.

The graft should be placed at once upon the plate, and smoothed out as well as possible while still moist, as it dries rapidly and tends to curl upon itself.

The particular advantages claimed for the use of the plate over any other method of skin grafting are:

1. It enables one to place the graft at once in the position wanted.
2. It holds it down in the very bottom of the artificial cul de sac until it has adhered, so that the raw surfaces of

the lid and ball in no part can again unite with each other in this angle, and even when the graft lives gradually push it upward, as, in my experience, it does, unless the plate is used.

3. We secure with the plate accurate approximation and rest.

I am indebted to Dr. Boettcher for valuable suggestions and assistance while operating most of these cases, and to Dr. Jordan, also, for assistance and after-care of the Infirmary cases.

ANAMALOUS DIRECTION OF RETINAL VESSELS
ON EMERGING FROM AND ENTERING
OPTIC DISC.

By E. F. SNYDACKER, M. D.,

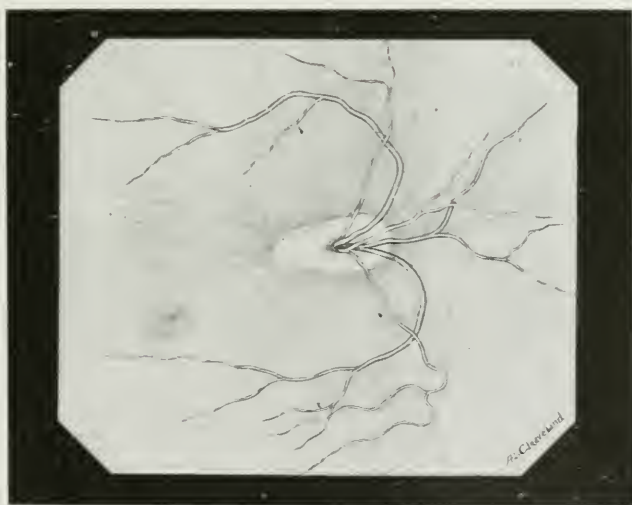
CHICAGO,

OCULIST AND AURIST TO COOK COUNTY HOSPITAL. ASSISTANT
SURGEON ILLINOIS EYE AND EAR INFIRMARY.

ILLUSTRATED.

Several years ago the following case came under my observation. I copy exactly the notes made at the time.

Name. Isaac Horwitz.



Right eye. Case I. Inverted picture.

Age 14, Russian Jew, comes because of poor vision.

R., v. = 20/200.

L., v. = 20/200.

Sn. No. 2, 6 to 10 inches.

Media clear.

Tendency to Divergence 4°.

Ophthalmoscopic examination. Small conus down and in, and present in both eyes. Oval papilla, long axis horizontal.

Refractive error — 3.25 cyl. a 165°, R. E.

— 3.25 cyl. a 180°, L. E.

with correction $V. = \frac{20}{100}$ in each eye.

The conus and error of refraction did not adequately account for the poor vision, so at first I judged this to be a case of congenital amblyopia without ophthalmoscopic findings.

After a number of examinations, however, an anomaly came to light which I had at first entirely overlooked.

The following was the condition in the right eye. The superior and inferior temporal veins and arteries on emerging from the optic nerve, instead of taking their customary course, proceeded directly toward the nasal portion of the retina as if that were their destination. The superior vessels held that course till they were well over the edge of the disc, then at the distance of perhaps $\frac{3}{4}$ the diameter of the papilla from the edge of the nerve, they turned sharply toward the temporal portion of the retina dividing and being distributed in the usual manner. The inferior vessels did not hold their course as far inward as the superior ones, but at a distance of about $\frac{1}{2}$ the diameter of the papilla from its edge they turned sharply toward the temporal side of the retina and were distributed as usual. In the inverted picture, all the vessels seemed to trend sharply outward as if pulled in that direction, while the inner portion of the field seemed to have no vessels at all. The picture in the left eye was essentially the same as that in the right. At that time I did not associate the poor vision with the anomalous vessel picture, but regarded the two merely as a coincidence or attributed it in part to the conus. Strangely enough within three weeks another case very similar to the first presented itself.

Case 2. Louis Ginsberg, aged 23, Polish Jew.

R. V. = fingers 3 meters.

L. V. = 20/200.

Media clear, pupils react promptly to light and accommodation.

Right Eye reads Sn. 0.50, 4 to 6 inches.

Left Eye " Sn. I, 9 to 13 "

R. V. with — 9 sph. = 20/40.

L., V. with — 3 sph. — 50 cyl. a 180° = $\frac{20}{50}$.

Ophthalmoscope shows in right eye conus on temporal side of disc, in left eye a small triangular conus down and in. Vessels emerge from lower part of disc. The superior and inferior temporal veins and arteries on emerging from disc take an inward or nasal course until well over the edge of disc and then bend sharply toward temporal region. Otherwise nothing of interest. Since that time the following cases have come under my observation, the essential features only of which I shall enumerate to save useless repetition.

Case 3. Katie R., aged 13.

R., V. = $\frac{20}{50}$.

L., V. = $\frac{20}{70}$.

Ophthalmoscope shows: Right eye conus down and in, vessels emerge, normally, small disc. Left eye, small disc, no sign of a conus. Physiological cup near lower inner border of disc: temporal vessels on emerging take a nasal, and somewhat downward course; when just over the edge of the disc they circle about the upper branches passing up and out, the lower ones down and out dividing in the usual manner.

Refraction. R. E. + 1 sph. — 2.50 cyl. a 180° V. = $\frac{20}{30}$

L. E. + .75 sph. — 1.50 cyl. a 165° V. = $\frac{20}{40}$

Cases 4 and 5. James and Gus Petersen. Brothers, sons of Swedish parents who are first cousins.

James Petersen, aged 12.

R., V. = $\frac{20}{100}$.

L., V. = $\frac{20}{100}$.

R. E. — 1.50 sph. — 1.50 cyl. a 180° V. = $\frac{20}{40}$.

L. E. — 1.50 sph. — 2 cyl. a 180° V. = 20/30.

Ophthalmoscope shows small triangular conus below

the disc in each eye. Vessels in both eyes have appearance as if all the trunks emerging from the disc were pulled out toward the nasal side, the temporal as well as the nasal vessels taking an almost parallel course inward, when over the edge of the disc the temporal vessels bend rather sharply toward the temporal part of the retina.

Case 5 Gus Petersen, aged 14.

R. V = 20/70.

L. V = 20/70.

R. E. — 1.75. cyl. a 135° V = 20/30.

L. E. — 75 cyl. a 40° V = 20/30 +.

In the right eye just a faint indication of a conus at the lower inner portion of the disc, in the left eye a small triangular conus; in both eyes temporal vessels emerge pointing nasally, take a short nasal course and then circle about.

Case 6. Hattie H. of American born parents, German decent.

Father and mother distantly related.

R. E. Vision with — 12 sph. = 20/40.

L. E. Vision with — 11 sph. = 20/40.

Ophthalmoscope shows each nerve head surrounded by ring shaped area of chorioidal atrophy. In both eyes temporal vessels take the reversed direction on emerging, soon bending about and taking the temporal direction.

Case 7. Frank R., aged 5. Did not begin to talk till three and a half years old. Backward and rather slow of comprehension, but a handsome, well formed child; with retinoscope, refractive condition found to be.

Rt. E. + 10 sph.

Lft. E. + 8 sph.

On account of the uncertain answers, vision of the child could not be accurately ascertained. The lens was present, the media clear, no sign of a conus nerve head in both eyes, very small, edges of nerve blurred presenting condition described by Gloor, Ottbeck, and others as pseudo neuritis. Near inner border of disc in both eyes temporal vessels take the nasal direction, pass well out over nerve head and then turn about. An older brother of this patient whom I examined did not present this anomaly.

If now we examine these cases collectively a number of

interesting, as well as practical points present themselves. In ten eyes where this condition was present, in spite of the fact that very few of the cases presented excessive degree, of ametropia, and in spite of a careful correction of the refractive error, the average acuity of vision was only 20/50, and in no single case was there a vision of 20/20.

This condition can hardly be called a rare one; unfortunately I am unable to state accurately what proportion the number of these cases bears to the total number of cases examined during this time. Computing the total number of cases however as carefully as I am able, I approximate the proportion of these cases at about one in four hundred.

The total number of eyes where the reversed vessel exit was present numbered twelve, in seven eyes of these twelve a conus downward from the optic disc was present; in the two eyes of case VI the circumpapillary atrophy of the chorioid may have marked a conus downward, so it is safer to throw case VI out of the question and say that in seven cases out of ten where the reversed vessel exit was present a conus downward was also present.

In case three, strangely enough, the conus is present in the eye where the vessels emerge normally, while in the other eye where they emerge anomalously, no conus is present.

Schnabel, Elsching and others are undoubtedly correct when they claim that the conus downward from the optic nerve must be classed with coloboma; so that whether we accept the arrested development theory of Hess, or the inflammatory one of Haab and Fuchs, as the cause of colobomata in either case the conus downward dates back to some pathological condition during uterine life.

In cases II, III, and VII the physiological cup was markedly displaced from the normal position, in cases II and III downward, in case VII inward. In cases III and VII an unusually small optic disc is present.

These small optic discs and misplaced physiological cups must be regarded as congenital anomalies. In two cases (IV and V) the parents were closely related, in one case (VI) distantly. In case VII, the child was backward and the condition of the (Refract. + 10 R. E., + 8. L. E.) one

which must be regarded as essentially one of microphthalmus.

In short, in every case excepting perhaps case VI there was in one eye or the other some congenital deficiency present, besides the anomalous vessel exit, and in a large proportion of the cases something in the history of the individual which might lead us to suspect degeneracy, e. g., relationship of parents in three cases, deficiency in mental development in one case.

Taking these facts into consideration, we can say that in all probability the reversed exit of the vessels is a sign of congenital deficiency in the eye where it is present and is usually accompanied by other congenital defects.

All of these cases presented marked errors of refraction, the most common error of refraction being myopic astigmatism, compound or simple two were cases of compound myopic astigmatism, two of simple myopic astigmatism, one of mixed myopic astigmatism, one of myopia and one of hypermetropia.

A rational explanation for the myopic astigmatism and myopia present in these eyes would seem to be, that through congenital defects, the coats of these eyes are lacking in power of resistance and when subjected to even ordinary ocular wear and tear they yield and the eyes become myopic.

What the poor vision in these cases is to be ascribed to, is difficult to state: the ametropia, as has been said does not alone account for it; in none of these cases were any demonstrable retinal or chorioidal changes present; the truth of the matter seems to be, that where an eye differs in type from a normal eye, whether this difference be due to a coloboma or conus downward, to an anomalous vessel exit, to anomalies in size of the disc or position of the physiological cup. In the majority of cases in spite of careful correction of the ametropia we may expect a vision below the normal.

But very little mention appears in the literature concerning this condition.

Fuchs (*Beitrag zu den Angeborenen anomalien des Sehnerven Arch. f. Ophth.*, Vol. XXVIII, p. 138) incidentally mentions the fact that this condition which he has called "Verkehrte Gefässordnung" is present in many cases

of conus downward. Fuchs thinks that where the anomalous vessel exit is present and the conus downward absent, we must assume this as the "Andeutung" or tendency to conus formation. This, of course, is assuming more than can be substantiated.

Elsching (Das Colobom am Sehnerven eintritte und der conus nach unten) (Arch. F. oph. Band LI Heft 3) describes a case of square oval papilla, physiological excavation, displaced eccentrically downward, anomalous vessel exit, and a marked niveau difference between the upper edge of the papilla and the conus surface. This case was examined microscopically, the findings about the nerve head were a staphylomatous stretching of the ocular membranes around the lower portion of the disc, as aphasia of the lower half of the optic nerve, atrophy of chorioid and absence of retina in the region of the conus and a pocket-like rudimentary strip of retina between chorioid and sclera in the region of the conus.

Salzman (Die Atrophia ner Aderhaut im Kurzstchtigen Auge. Arch. f. Oph.) mentions the fact that an anomalous vessel exit was present in an eye examined microscopically by him, on vertical instead of the usual horizontal section, through the nerve head, he found the intervaginal space wider in the region of the conus. In its passage through the lamina cribrosa the optic nerve rapidly narrows down, becoming cone shaped. The lower wall of the optic canal is steep, the upper wall overhanging. At the level of the inner surface of the lamina cribrosa, the lower wall of the optic nerve bends at a right angle downward, and in this manner lies in almost the same plane as the inner surface on the chorioid, differing in nothing essentially from the well known picture of the "Distractionen sichel" in myopia. The cause then of this anomalous vessel exit is congenital, and is due in all probability either to some developmental irregularity or some inflammatory change during uterine life which, perhaps, makes traction on the optic nerve during its development, changes its axis and thus causes it to enter the eyeball in an atypical manner causing the vessels to assume in their exit a reversed or anomalous direction.

If many of the so called cases of congenital amblyopia are examined with reference to this condition, I have no doubt it will be found present.

103 State Street.

REPORT OF A CASE OF TOXIC AMBYLOPIA FROM COFFEE.

BY P. B. WING, M. D.,

TACOMA, WASH.

ILLUSTRATED.

On June 22nd, 1902—the patient, an apparently healthy, well-nourished boy, of eight years, was brought to my office by his mother, who stated that since January, 1902, she had noticed failing vision and that he had been sent home from school on account of his eyes; that she had consulted a home physician, who had fitted him with

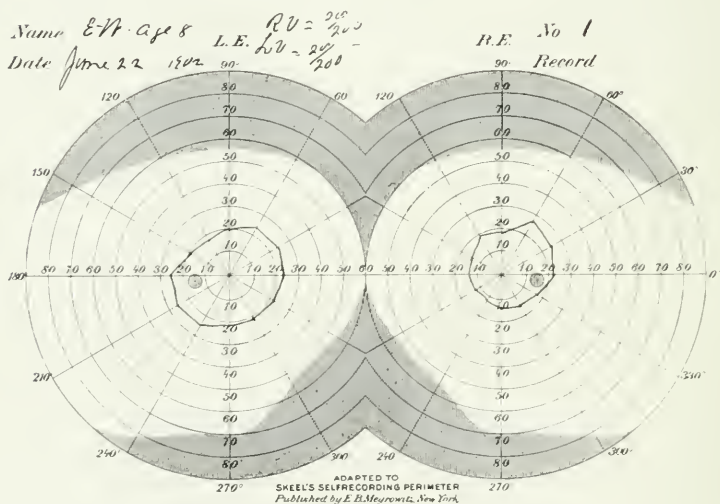


Diagram No. I.

glasses, but as the vision had steadily become worse, so that he was unable to attend school, he was brought to me; upon examination I found the conjunctiva normal, cornea, lens and vitreous clear—pupil a little larger than normal and sluggish—the optic disc was much congested; could hardly distinguish the outlines. Retinal veins large—arteries small—vision hardly 20/200 in each eye for dis-

tance, near vision correspondingly reduced; field contracted as shown in Diag. No. I. I tried to find some

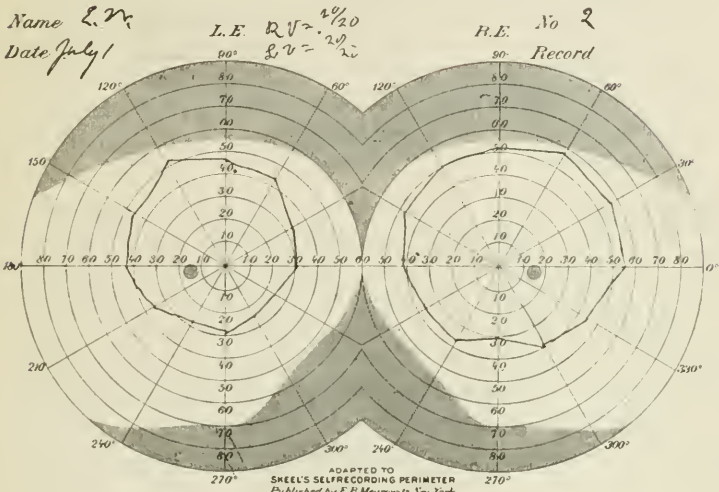


Diagram No. II.

cause for the toxic condition—thinking the boy might be smoking cigarettes; but there was no history of using

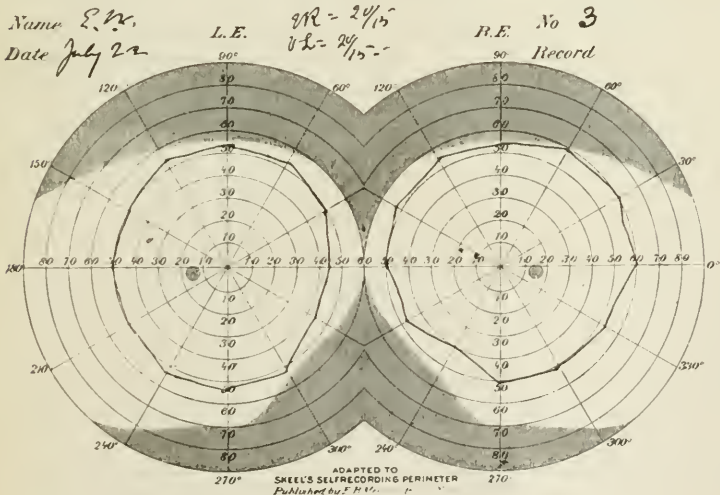


Diagram No. III.

tobacco in any form, I told the mother that there certainly was a cause for the condition and asked her if she could

think of any thing in the boys habits that could possibly cause it—she replied, “Would coffee hurt him?” I asked how much he drank—she replied, “Two cups of strong, black coffee at each meal without cream or sugar; and frequently he visits his grandmother and has cake and coffee between meals.” Six to eight cups of strong coffee daily, and the patient but eight years old! I ordered the coffee stopped at once and substituted postum cereal.

Gave strychnine 1 50 gr. t.i.d. and ordered him returned in one week. He returned in eight days; the vision had improved from 20/200 to 20/20, though still slow and hazy—field had increased as shown in chart No. II. I ordered the treatment continued for a month. Upon his return, July 22nd, vision was 20/15 and distinct; near vision perfect—field had further increased as shown by chart No. III. Vision has remained perfect and health good. He returned to school in September, and has had no trouble.

I report this case as I never remember of reading of a well authenticated case of toxic ambylopia from coffee.

CURE OF PULSATING EXOPHTHALMOS BY LIGATION OF THE COMMON CAROTID ARTERY.

BY H. V. WÜRDEMAN, M. D.,

MILWAUKEE, WIS.

Ligation of the common carotid artery is the most reliable treatment for pulsating exophthalmos, being effective in about 60 per cent. of the cases operated on. Death has followed in about 10 per cent. of the remainder. (R. A. Reeve, p. 201. System, Dis. of Eye, Nose, Throat and Ear. Posey and Wright, 1903.) In several cases the surgeon has proceeded to ligation of the external carotid on the other side and even to ligation of the second common carotid after failure of the first ligation on the affected side to relieve the disease. Spontaneous recovery and expectant treatment (with iodide of potash, quiet, etc.), results in only 7 to 8 per cent. of recoveries. Compression of the common carotid gives some relief in most cases and if kept up for an hour or so every day for months is said to have succeeded in a somewhat larger percentage (Reeve, loc. cit.).

Cases of this affection are relatively very uncommon. I can call to mind but four occurring in my own practice, two of which were not seen after the first examination. The history of the third case is appended:

History, March 20, 1902. Mrs. J. W. A. of New Hampton, Ia., aet. 40, was brought to me by Dr. W. B. Hill of Milwaukee for a protruding, congested and painful right eye. She complained chiefly of the proptosis, the eyeball having on several occasions come out so far that it was reduced with difficulty, of the buzzing and roaring sounds in her head, which "almost made her crazy," and of vertigo, especially on rising from the recumbent posture.

The family history showed nothing abnormal, she had been the mother of several children and had been generally a healthy "hard working" housewife.

Two years before she had been sitting on a window ledge washing the glass from the outside and being in a

constrained position "felt something snap in her head" was dizzy, vomited and went to bed. She shortly after discovered that the right eye protruded and that she saw double. Rushing sounds and headache followed; after several weeks the eye protruded more, and the ocular conjunctiva became more congested. The subsequent history shows that she consulted several physicians receiving various opinions and being subjected to various forms of treatment:—One of these proposed enucleation! The patient consulted Dr. W. B. Hill, and he suggested examination by me.

Examination March 20th, 1903. Patient was a medium sized woman, in general good health; heart, lungs, kidneys (urine examined) and other organs apparently normal with exception of eyes.

Eyes: V. R. = 6/XXIV with + 1.50 90° = — 6/VIII; L. same but with same correction V = 6/VI. Presbyopia 1.00. Visual fields large, small paracentral scotoma in right. Dist. 10° exophoria, 10° R. hyperphoria. Left eye otherwise normal; but the right protruded, conjunctival and ciliary veins tortuous and ball congested, protrusion and congestion more marked on lowering head so that eyeball could be easily dislocated between lids and was difficult of reposition. After bending down the symptoms of dizziness, headache and noises in head were greater and the vision on the effected side much lessened. A bruit could be readily distinguished by touch and the roaring sound by the stethoscope was heard perceptibly later than the ventricular movement of the heart. The bruit was greatly increased by bending over and somewhat so by the reclining position. Finger pressure upon the closed lids reduced the exophthalmos, but protrusion immediately recurred. Pressure over the external carotid and the common carotid in the neck, stopped the bruit and partially reduced the exophthalmos but was followed by recurrence on removal. Under digital pressure over the carotid the conjunctival veins and right side of face became more congested, due of course to interference of the venous current in the jugular veins. Ophthalmoscopic examination showed right retinal veins dilated and tortuous, the arteries being relatively larger than on left side.

Diagnosis of Pulsating Exophthalmos was made; *Treat-*

ment by tying common carotid on the affected side was advised; *Prognosis* given was guarded but favorable. The patient accepted the results of the consultation and went to Trinity Hospital for operation.

Operation March 21. Ligature of the right common carotid artery by Dr. W. H. Earles, Dr. W. B. Hill administering ether, Dr. Nelson M. Black and I assisting with the operation.

A long incision reaching from the jugular fossa to the clavicle was first made and the tissues carefully dissected down to the jugular veins and the external carotid artery. The veins were found enormously distended, and only by extreme care and delicate handling were the surgeons enabled to reach the artery without rupturing their coats. Tying of the external carotid was then tried, but the bruit and exophthalmos persisted so the operation was extended to occlude the common carotid by two ligatures, which immediately had the effect of reducing the protrusion of the eyeball and reducing the ocular congestion, both of which, from the influence of the narcosis, had become very great. At this time two of the branches of the internal jugular, swollen as they were by the venous stasis and from the necessary handling, had started to bleed and in the endeavor to stop the hemorrhage by hemostatic forceps one ruptured, the venous blood welling forth in a dark flood. Digital compression stopped the hemorrhage sufficiently to allow of ligature being tied. The field of operation becoming dry, the parts were brought in position by sutures and bandages applied. Time of operation, 1 hour, 35 minutes.

After treatment. Rest in bed with the feet higher than the head for 48 hours; liquid diet and usual nursing.

Condition after operation. From the time of operation the eye retracted, the bruit was stilled and the ocular congestion greatly diminished. The head noises were at once relieved and the patient rested well; no pain nor hyperexia, and uninterrupted recovery. Dressings made on the 5th, 7th, 9th and 11th days.

Effect of treatment. The operation had the immediate effect of cutting off most of the blood supply to the eye and to the varix behind the eye in the orbit and cerebral cavity, thus reducing the exophthalmos. After the car-

otid was occluded, examination of the fundus by the ophthalmoscope showed that the retinal arteries carried less blood and the veins were less full and tortuous.

Final condition, May 14. The vision of the right eye was 6/XXXVI without correcting lenses and 6/VIII with same, while the left secured vision 6/V with correction diplopia had disappeared. The visual field was normal, no scotomata could be elicited. The retinal veins on the affected side were more tortuous and full than on the other. The conjunctival and ciliary vessels carried more blood than the other and were permanently in a varicose condition. The exophthalmos, the noises in the head, the headaches and the general nervous disturbances had disappeared and at this date (Jan. 15, 1903) are believed to have been permanently relieved.

I can not let pass the opportunity to remark that enucleation of such an eye would have been a grave mistake, as the varix behind the ball would certainly have protruded in a mass between the lids causing a dangerous bleeding tumor as did occur in another case of which I have hearsay evidence, in which tying of the carotid was finally resorted to.

The best treatment for pulsating exophthalmos* is checking the blood supply by ligature of the common carotid. The operation, though formidable, should be made in the majority of uncomplicated cases.

* Within a few days I have examined a case of exophthalmos due to the same cause, in which for the present I have deferred advice as to operation of this nature as the subjective symptoms are very slight. I have here advised treatment iodide of potash and compression of the external carotid by a spring pad for several hours in A. M. and P. M., together with abstinence from physical strain.

105 Grand Ave.

FOUR EYE INJURIES WITH INTRODUCTION OF FOREIGN SUBSTANCES NOT SUITABLE FOR REMOVAL BY MAGNET.

BY M. W. ZIMMERMAN, M. D.

PHILADELPHIA, PA.

ILLUSTRATED.

Case 1. Brass or copper foreign body in the vitreous for fourteen years with retention of normal vision.

This patient was treated by the late Dr. George T. Lewis at the time of the accident and during several subsequent month's but through the kindness of Dr. Lewis' family I have had access to all of his notes and condense the main facts as follows. On Jan. 11th, 1889, I. I. a boy perhaps twelve years old, threw into an open fire what was described as a "dynamite fuse." By looking from behind



the shelter of a tree at the moment of explosion, the patient was injured in the left eye. One hour later there was a small lacerated wound of the sclera, six lines from the nasal border of the cornea. The anterior chamber was entirely filled with blood, and the tension was below normal. After appropriate treatment, eleven days later the blood had entirely disappeared, and a foreign body of pale yellow color could be seen in the vitreous, immediately behind the crystalline lens.

The above diagrammatic drawing made at this time, gives very accurately the size of the fragment relative to the dimension of the ball on the same plane. In six weeks treatment was stopped entirely, and a little later the patient was able to read with comfort. On Feb. 12th, 1891, the patient returned reporting pain for forty-eight hours,

with some ciliary injection, photophobia, and a distinct clouding of the vitreous. Within a few weeks this mild attack of hyalitis had entirely disappeared.

On March 18, 1896, the patient first consulted me, but only on account of ordinary asthenopic symptoms, equally severe in both eyes, which had followed an attack of influenza; the patient also reported hard study. With the accommodation controlled by hyoscyamine, vision in both eyes was 15/20?, but the addition of a cylinder + .25 D ax 180 degrees gave him normal vision. There were no lesions of the eyegrounds or media except in the left vitreous chamber where was found the foreign body as described above. There was at this time a slight motion of the fragment upon quick rotation of the eyeball, showing it to be outside of the lens. The surface looked bright and pale yellow, suggesting brass, although at the time of the accident when the matter was probably clearly understood, the cartridge case had been reported by the family to be of copper. Thinking the patient entitled to all possible help, he was given the above cylinders with a slight addition for study only, and this correction gave complete comfort and satisfaction for several years, except during one day just after beginning their use, when there were symptoms of ciliary spasm.

My last note is dated March 8th, 1902, when he reported perfect comfort for all purposes, there having been no symptoms whatever except a brief local pain after exposure to the glare of the sun or snow. At this time the vision in either eye without a correcting lens, was 20/15? The foreign body seemed slightly more encrusted and a little lower in the vitreous. The small movements of the fragment, which followed changes in the positions of the eye, seemed to me pronounced and I found a few fine vitreous opacities not previously noted. These changes, if my observations were accurate, would indicate the earliest degenerative processes, but the history of the case does not yet confirm this view. This is the only instance of my experience, in which unimpaired vision and perfect comfort followed for any length of time, the retention within the vitreous of a foreign body of any character. It has been claimed that fragments containing copper are peculiarly dangerous. This case was shown to the ophthal-

mological section of the Philadelphia College of Physicians on the evening of November 17, 1896, at which time the fragment had been in position for nearly eight years.

Case 2. Multiple Wounds by a Chestnut Burr, Including Penetration into the Anterior Chamber and Numerous Imbedded Spines, Normal Vision Retained.

On September 23rd, 1894, a lad, E. P., was struck in the right eye by a falling chestnut burr. The accident occurred while he was standing directly under a tree with the head thrown back, looking upward to note the effect of a thrown missile. The falling burr was not seen by the patient, and struck while the eye was widely open. He was taken at once to the physician in attendance upon the school, who is reported to have removed a certain number of imbedded spines, but all the details of his treatment have been forgotten. I first examined the eye five days after the accident, in consultation with Dr. R. T. Pitfield of Germantown. There were numerous small wounds in the skin about the eye, but in almost every instance the spine had been withdrawn, owing probably to the comparative looseness of the tissue. At all events these wounds, although numerous, were not important and require no comment. At this time one small spine entering the cornea, vertically at the pupillary margin, with the base projecting and the point penetrating the anterior chamber to the plane of the iris, was removed by means of the cilia forceps, and was followed by the greater portion of the aqueous humor. Three other spines were seen, two of which were thick and imbedded obliquely over the centre of the pupil entirely within the corneal tissue, and not projecting. These were removed after making incisions with a cataract knife through the over-lying tissue. A number other imbedded spines were seen, one of which reached into the anterior chamber, but as none of them protruded externally it was impossible to extract without further mangling of the cornea, and it was thought wise to postpone their removal. The eye showed but moderate symptoms; there was some injection and edema of the lids, but no evidence of infection. At this time no wound of the lens was noted. Atropine, bandage and other appropriate treatments were given. On the following day the conditions were unchanged, but for the

first time a small crescent-shaped opacity was discovered on the anterior surface of the lens, in all probability made by the point of the deep spine extracted on the previous day. Very gradual improvement took place in all the symptoms and nothing worthy of detailed mention occurred until the 30th of October, when it was found necessary to use cocaine and extract with a sharp hoe-shaped spud, a large spine almost in the centre of the cornea, which had become prominent. The size of this spine was undoubtedly due to the absorption of moisture, and its removal was again followed by nearly the entire contents of the anterior chamber. On November 8th, another spine was removed from near the centre of the cornea. On November 15th, it became necessary to excise with the surrounding conjunctival tissue, one of the several small spines which had been previously noted in the sclera, outward. On the 1st of December, when the eye was still under the influence of mydriatic, vision was recorded as $1/5$. Ten days later the correction of a hypermetropic error brought this to $2/3$. Gradual eye use was resumed and a few days later treatment was discontinued. On the 14th of February, 1895, he returned with ordinary asthenopic symptoms and a small spine was discovered in the lower part of the cornea, and an effort made to remove it, without success. Two months later this spine had entirely disappeared, either by absorption or spontaneous delivery. On the 6th of February, 1897, the eyes were both in good condition, but the old deeply buried spine in the sclera directly outward, had again become prominent. The conjunctiva was opened, and an effort to remove it bodily having failed, all foreign material was scraped out.

After this the history was uneventful. The refraction was estimated twice, always showing moderate hypermetropia with a little astigmatism, and securing with lenses a vision or $6/6$ in either eye. The patient has been under observation ever since, and although the opacity on the lens has not disappeared, the eyes have been entirely comfortable and no permanent injury seems to have resulted from this unusual accident. It is impossible to report the exact number of spines imbedded in the eyeball, but I believe the patient's estimate of thirty-six is approximately cor-

rect. Three of these penetrated the interior chamber, the removal of two resulting in a complete emptying of the aqueous humor. One spine succeeded in wounding the anterior surface of the lens to a limited extent. Considering these more serious wounds and also the fact that each of the smaller ones was in addition, a possible source of infection, the recovery of this eye with unimpaired vision is very remarkable.

Case 3. Spontaneous extrusion of a glass fragment from the vitreous chamber.

The subject of this accident had been under my care in the out patient department several times. At the age of four years he was treated for some time on account of chronic inflammatory disease involving both eyes, of about two years duration, which had resulted in numerous fine scars of both cornea, but which at the time I saw him, was most pronounced as a marginal blepharitis of the stubborn type. Appropriate treatments were given but the patient disappeared and was not seen for nearly six years. He reappeared at the clinic on the 2nd of July, 1900, with eyes comparatively free from active inflammation, but vision was very much impaired by the corneal opacities, and a high degree of hypermetropia. At this time his refraction was very carefully estimated with the eyes under the influence of atropine, and a prescription was given for sp. + 4D. in both eyes, the total error being somewhat larger. The glasses were satisfactory, and the patient disappeared until October 16th, 1900, when he was admitted to the wards of the Germantown Hospital on account of the accident about to be recorded. His age at this time was ten years.

On the morning of the same day while wearing the glasses previously mentioned, he had fallen down stairs, striking his glasses on one of the sharp angles and breaking the left lens, fragments of which caused an irregular incised wound in the left lower lid, about three-fourths of an inch long, parallel with and about a quarter of an inch from the lid margin. The wound passed through the lid but on its inner side scarcely exceeded a quarter of an inch in length. Directly opposite and as a continuation of the lid wound, there is an opening in the conjunctiva and the under-lying sclera, about five or six

mm. long. There was no gaping of the wound, no protrusion of vitreous, and the careful introduction of a fine silver probe failed to detect a foreign body. There was some little external hemorrhage and considerable conjunctival chemosis with a dilated pupil. The interior of the eye could be very readily explored, and although the site of the wound could not be seen owing to its location comparatively near the ciliary body, yet there was an absence of evidence of injury throughout the vitreous, with the exception of a slight hemorrhage which made a faint trail from the direction of the wound upward. No evidence of a glass foreign body could be found. No erratic reflection of any sort could be seen in the vitreous chamber, and it was assumed that the fragment which had caused the wound had been withdrawn at that time. The external wound was lightly sutured. Ice compresses were used in addition to atropine and an antiseptic collyrium. No violent reaction occurred and the treatment was continued until the 22d day of October, six days after the accident, during all of which time the progress seemed that of normal convalescence from a simple wound. On the latter day the dressings were removed in the morning as usual, when a small fragment of the spectacle lens was found lodged entirely in the lower conjunctival sac. This fragment was 7.5 mm. long, somewhat triangular in shape, and weighed $1\frac{1}{2}$ grain. Its extrusion seemed to cause no damage beyond re-opening the conjunctival and scleral wounds, or violent reaction. The eye convalesced rapidly until the 29th of the month when he was discharged from the ward, with vision only moderately impaired.

Case 4. An unsuspected fragment of stone removed from the lens after ten days.

On August 11th, 1892, N. W., aged 30 years, a negro workman in a stone quarry, was struck in the left eye by a fragment which was supposed not to have entered the ball, but which resulted in a rapid loss of vision with pain and symptom of severe traumatism. The treatment if any, is not known until his appearance seven days after the accident in the service of Dr. A. D. Hall of Wills Hospital, who admitted him to the wards and placed him in my care. Vision was reduced to light preception and the eye was

quite painful. There was a healed irregular wound about 5 mm. long just above the corneal centre, and the iris was attached to the posterior surface of the scar. The lens was entirely opaque and swollen, the anterior chamber being quite obliterated except in its lower part. The eyeball was deeply injected and tension recorded as +1. Other methods of treatment having failed, three days later paracentesis of the anterior chamber was performed, and about half the swollen lens evacuated. In securing this result the instrument was introduced well into the upper part of the anterior chamber and at this point came in contact with a foreign body, which however could not be seen. A narrow formal iridectomy was at once made above the site of the original wound. Iris forceps were introduced and the unseen fragment was readily grasped, being located above and behind the iris, but to some extent attached to the latter structure by lymph. The original wound was found inadequate and was enlarged, after which the fragment was easily delivered and proved to be a stone 5x3x3 mm. in size. Pain subsided at once and convalescence was rapid, but after the absorption of the remaining lens substance vision was not improved, owing principally to numerous iritic attachments. Some of these synechia were subsequently released by a curved capsule knife and a violent reaction resulted, leaving the vision practically unchanged. No other operation was performed and the patient was discharged with light perception only.

A CASE OF ACUTE GLAUCOMA WITH IRITIS, FOLLOWING CATARACT EXTRACTION.

JAMES BORDLEY, JR., M. D.,

BALTIMORE, MD.

This case was first seen by me Oct. 10, 1902, at the Baltimore Eye, Ear and Throat, Charity Hospital.

K. J., colored woman, aged 79, very feeble, nervous, but of robust appearance. Urinary examination: slight amount of albumen, some granular casts, no sugar, sp. gr. 1020, color rather dark, says passes normal amount (strict quantitative test never made). Arteries rather hard, especially temporal.

History of blindness, extending over period of several years in the R. eye and of rather shorter duration in L. eye. The cornea and aqueous were clear, irises good color and reacted to light stimulation. light perception and projection perfect in both eyes. The patient's mental action was rather slow. Both lenses showed complete cataractus changes.

Removal of cataracts was advised, and the patient entered the Hospital Oct. 16, 1902. I determined to operate first on the R. E. The eye was prepared for the operation in the usual manner, by frequent irrigations and applications of a pad saturated with a 1-8000 bichloride solution.

The patient, previous to the operation, was nervous, and apprehensive of great pain, every means of persuasion was used to quiet her nerves and fears with but slight result.

Under cocain anesthesia a combined extraction was undertaken. As soon as the section was made the patient forced her lids together very violently, tossed her head and made a great fuss. Before the speculum could be withdrawn she had dislocated and forced out the lens through the corneal incision, the lens was followed almost immediately by about one-third of the vitreous humor. The cornea collapsed, and the upper portion was com-

pletely everted. Every attempt to replace the cornea was followed by the same self controlled negro blepharospasm, and by the presentation of more vitreous. I closed the eye, using a sterile pad and a Murdock eye shield—not wishing to exert much pressure.

The eye was not opened for five days as it gave the patient no pain and there was apparently no undue amount of secretion. The eye was in fairly good shape, the cornea was in good position and the incision had healed perfectly except above, where there was decided dimpling. The iris was tucked up and partly incarcerated in the corneal wound, the upward displacement of the pupil giving very much the appearance of an iridectomy. Some iritis of a low grade, tension normal, light perception only. It was not possible to see the fundus.

Atropia was instilled, at first once daily and later twice daily and sodium salicylate in 15 grain doses three times a day was also ordered. The recovery from the operation was uneventful, taking about four weeks.

It then became a choice of an operation on the left, the unoperated eye, or an iridectomy on the right eye in which the light perception was apparently perfectly good. I chose the left eye, because I felt that in order to accomplish anything it would be necessary to give a general anesthetic, the sight in the left eye was a certainty, if the operation terminated successfully, while in the right eye it was a most doubtful quantity.

The L. E. was operated on just nine weeks after the R. E. was declared well, 13 weeks after the first operation. Chloroform was used and a combined extraction was successfully made. The operation was smooth, the recovery rapid and uneventful, the subsequent sight good. One month after the operation, the fundus was carefully examined and found normal, the vision tested and the following glasses ordered for constant use: R. E. Plano; L. E. + 10 S. \ominus + 2 C. ax. 180° . Her vision in L. E. was practically 20/40.

I did not see the patient after the glasses were ordered for three weeks. When she returned, her L. E. was markedly injected, the cornea was very densely steamy, tension + 2, doubtful light perception. Distressing neuralgic pains radiated over the temporal and forehead re-

gions. With oblique illumination it was next to impossible to see the iris, impossible to study its condition.

Through a misunderstanding on her part, the patient had continued to use the atropia. The R. E. was perfectly quiet and gave her no pain.

I ordered solution eserine gr. one-half and instilled a two grain solution myself. I also ordered salicylate soda gr. xx, to be given every three hours until decided effects were felt. Patient returned in three days with no improvement in her condition. The same measures were continued and in six days the cornea had cleared up enough to get a look at the iris. Although very indistinct I thought I made out posterior synechia, T + 2.

I showed the case to my colleague, Dr. Samuel Theobald. He suggested the possibility of irritation of the L. E. resulting from the condition of the R. E. The pupillary area of the R. E. was extremely small, making the communication between the anterior and posterior chambers very limited, at the same time the traction on the iris as the result of the incarceration above must have been great. He suggested an iridectomy on the R. E. (the eye first operated upon), biniodide of mercury internally and a solution of atropia (gr. 4 to ounce) to be instilled into L. E. I accepted his suggestions. The patient was kept upon biniodide of mercury and atropia was instilled, three times a day, into the L. E. for five days. At the end of that time the patient was in practically the same condition as before starting the treatment. I then iridectomized the R. E. after a hard struggle with the patient, making the incision in the cornea below and the excision of the iris practically straight down. The L. E. improved from the day of the operation. As the cornea cleared, the pupil was shown bound down by posterior synechia. Two weeks after the operation on the R. E., the L. E. showed the T. normal, cornea clear, tags practically all broken down, vitreous clear, optic disc markedly cupped—which was not the case prior to the attack vision with + 8 S. \ominus 2 Cyl. ax $180^\circ = 20/70$, a change of 2D within two months. The iridectomy on the R. E. was satisfactory and the patient's recovery uneventful. I was able after the operation to make out in the R. E. extensive changes in the vitreous.

To briefly conclude: The iritis of the L. E. was probably produced by reflex irritation, shown by the fact that constitutional treatment and treatment of the eye produced no change in its condition, while, an iridectomy of the other, apparently quiet eye, resulted at once in decided beneficial changes. The iritis was clearly shown by extensive posterior synechia, the swelling and discoloration of the iris. That there was a glaucomatous condition present at the same time was shown by the extremely high tension, steamy cornea and the marked cupping of the optic disc—which was not present before the inflammatory process was established. It may be of interest to state that prior to the attack no adhesions were present, in the L. E. The first changes for the better were in the glaucomatous symptoms, the iris tags giving way later. Eserine had practically no effect, atropia the same, salicylate of soda failed to control the pain and biniodide of mercury failed to lower the tension.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

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AND

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(Quarter ending March 31, 1903.)

The Value of the Crede Therapy in the Treatment of Eye Diseases.

MEYER, PAUL. (*Centralblatt für Praktische Augenheilk.*, Feb., 1903.) The author has been using the salts of silver known as itrol (argent. citricum) aktol (argent. lacticum) and collargol (argent. colloidal Credé). Itrol is soluble with difficulty in water and is valuable for dusting over wounds, acting as a non-irritating antiseptic. Aktol is very soluble and is very valuable for making antiseptic solutions. Itrol is used particularly in infected wounds of the lids, conjunctiva and orbit, and is blown in with an insufflator. Good results almost always followed, even in infected wounds of the eyeball, when this product was blown into the wound. In fact, in all the commoner infectious external diseases itrol was found useful, with the exception of the tuberculous inflammations. Some pain is often felt and this is due to the mechanical effect of the insufflation. It is necessary, however, to do this, as we must get penetration. Cocain can be employed to allay this pain. It is advisable to use fresh itrol and the variety which is especially suited to eye affections. The chief value of this so-called silver therapy consists in the local and generally speaking harmless action, which may be

utilized not only as an operative antiseptic but also for fighting inflammatory conditions. Chlorine water and iodoform have been supplanted by itrol, collargol and atkol, and he advises their use even in cataract extraction, and iridectomies as a means of disinfecting the conjunctival sac.

Epiphora in Babies.

HEIMANN, Charlottenburg. (*Deutsche Med. Wochenschrift.*, 1903, No. 5.) According to Heimann the affection is rather common and whenever we meet with conjunctivitis in infants we should always make pressure over the site of the lacrimal sac to see if there is any secretion which can be pressed out. His opinion is that it is not due to an infection but to some retardation in the developmental process in the naso-lacrimal duct, causing an atresia. Massage over the tear sac several times daily is a valuable method of treating these cases. Probing of course should be done when these measures fail. It is important to establish the diagnosis in these cases, for little patients as we know are constantly exposed to eye injuries and such injuries would be much intensified by the presence of a purulent secretion.

Injuries from Lightning.

JELLINEK, S. (*Wiener Klinischer Wochenschrift*, 1903, 6) Jellinek's observations are based upon the study of three cases. The first was a peasant who was severely injured and who complained of seeing frequent sparks before his eyes, even when shut, accompanied with pain, and immediately afterward the room would seem as though enveloped in a fog or cloud. Externally there was nothing to be seen. The second patient showed the following symptoms. In one eye there was a subconjunctival hemorrhage. The lower half of the cornea of this eye was very cloudy and closer inspection showed that there were a number of fine deeper opaque spots which were also situated in the cloudy area. Ciliary injection was present. There was also sluggishness of the pupil. The patient complained of a constricted feeling in the eyeball. He recovered entirely. The third case was a girl, and after the stroke she was delirious for forty-eight

hours. There was left-sided ptosis, narrowing of the left pupil which acted even reflexly, very sluggishly. Accommodative reaction was present. When the patient was seen eight days later these symptoms had disappeared, though she still complained of some irritative symptoms in that eye. Externally there was nothing to be seen.

Methylene Blue in Diseases of the Eye.

JACQUEAU. (*Allgemeine Wiener Med. Zeitung*, 1903, 5.) Affections of the cornea, either with or without the formation of ulcers or abscesses, get well when instillations of methylene blue 1:1000 are made twice daily. It is said that Courmont by irrigating the eyes with this solution averted ocular complications in small-pox. Rollett uses subconjunctival injections 2:1000 in iritis complicated with hypopyon. In blenorrhea the pain is much lessened. In carcinoma the results are significant, and Leprineé in three cases of epithelioma of the lower lid obtained complete recovery by painting twice daily the lid with a 1:120 solution of acid. arsen. and also with a 1:100 solution of methylene blue. It is very important to use absolutely pure methylene blue, for most of the preparations in the market contain zinc and arsenic. Internally it is used in pills 0,20, and two or three of these daily. For external use, solutions of from 1-2:1000. For subcutaneous injection sterile five per cent. solutions. Toxic effects are improbable.

The Frequency of Spontaneous Detachment of the Retina in High Grades of Myopia.

BERGER, EUGEN. (*Wochenschrift für Therapie und Hygiene des Auges*, No. 24, 1903.) The details of the findings need not be given, but the author has analyzed the material in the clinics of Froelich and von Hippel by the way of an enormous amount of material. In analyzing Froelich's results he found that among 2261 eyes up to thirty years of age with myopia over 10 D. there were eighteen detachments, while von Hippel's material showed four detachments. The percentage of spontaneous detachments teaches us that we should undertake the extraction of the crystalline lens with extreme caution and that some moderation of the enthusiasm with regard to

this operation is in order. He takes occasion to tell us that Alfred Grafe first practiced this operation and should have the credit instead of Fukaia.

Remarks upon the Management in General of Epidemic Eye Diseases in School.

ZIA, H. (*Münch. Med. Wochenschrift*, Feb. 17, 1903.) Zia's observations were prompted by a recent epidemic which he had seen in one of the large schools in Marburg. He advises that the entire school be subjected to a rigid examination as soon as the epidemic appears, and this examination is to be made by an experienced oculist. Cases in which there are more or less abundant conjunctival secretion should be isolated and treated. Closing the school is not only unnecessary but can really do harm, for generally speaking these epidemics of ophthalmia in school are harmless and it is not likely that it will spread from scholar to scholar; and even when the epidemic is one of trachoma it is not advisable to close the school, for the danger of transmission is comparatively slight in school, or at least it can be better controlled than at home. Pupils who have undoubted trachoma should be isolated and treated, and this can be better carried out at the school than at home. If the secretion is profuse the children had better be kept away from the school, particularly when the disease is trachoma. Cases of conjunctivitis, caused by either the Koch-Weeks bacillus or the pneumococcus, should be isolated, and when the secretion is abundant they should not be allowed to come to school. An epidemic which breaks out suddenly is not apt to be trachoma. Prophylactic measures should consist in cleanliness, especially frequent washing of the hands, rubbing off the school benches, and avoiding the use of the same washing utensils.

Removal of the Crystalline Lens for Myopia With a Report of Fifty Cases.

EMMERT, E., Bern. (*Archiv. für Ophthalmologie*, LV Band. 2 Heft.) I need not go into the details of his results, but they are exceptionally good. All the cases which were operated upon since 1896 he has repeatedly

seen. In not a case was there a change for the worse, and in several the vision had improved. Not one regretted the operation and several wanted the operation on the other eye, and the majority were contented with the one eye. He explains his exceptionally good results partly through the fact that he selected his cases with great care. He limited the operation to those cases where the vision in spite of correction remains very defective and also where strong glasses can not be worn, and yet who want to see better in the distance.

Contribution to the Differential Diagnosis of Intraocular Cystercus.

SUSSKIND, Beuthen. (*Klinischer Monatsblätter für Augenheilk.*, Feb., 1903.) The author calls attention to the cases recently reported by Schmidt-Rimpler and others and he suggests that the affection is probably not so rare as is generally supposed. His case was that of a girl whose parents had died of tuberculosis and who had lost several brothers and sisters from scrofulous affections. The child's eye had been red for two months and she suffered considerably. There was slight ciliary injection and cloudy cornea. The pupil dilated readily under the influence of atropia. The anterior chamber had the proper depth. The vitreous body was full of floating opacities and membranes. Upward and outward one could see a slight reddish reflex and below the red reflex was quite clear. The fundus could not be seen. The tension was minus. She could see the movements of the hand. The diagnosis was made of probable tuberculosis of the choroid and a bad prognosis was given. She was given iodide internally and four per cent. salt solution was injected beneath the conjunctiva. She received six injections, and as a result the vitreous cleared up to such an extent that it was very easy to make the diagnosis of cysticercus. The parasite was removed. The interesting feature of the case was the use of the salt solution as a means of clearing up the vitreous and thus rendering a diagnosis possible.

The Extirpation of the Tear Sac as a Prophylactic Measures Against Septic Infections of the Eye in the Laboring Class.

AXENFELD. (*Klinische Monatsblätter für Augenheilk.*,

Feb., 1903.) The author calls attention to the frequency with which those engaged in mechanical pursuits are injured by foreign bodies. It is evident that the presence of a dacriocystitis would render more likely the infection of a wound made in this eye. The author is a believer in the conservative treatment, such for instance as massage, irrigation, probing; but among mechanics he is in the habit of urging extirpation of the sac, and for these people he is opposed to the conservative treatment, and even among the better class he thinks that when we are dealing with an old dacriocystitis, fistulæ and even in that form seen with trachoma the conservative treatment will be fruitless. Even in hypopyon keratitis the immediate extirpation of the sac is indicated, when we find this condition associated with a dacriocystitis. The conservative treatment has no place among the laboring class, and the extirpation should always be done. He then discusses the various operations such as those which have been devised by A. Graef-Schreiber, Kunht-Volckers and others and proceeds to describe an operation which he had devised and which he claims better results than any of those named. In four years he has performed two hundred and seventy extirpations and he has been impressed with the fact that during this time septic infections of the cornea have diminished in frequency. In only two cases after the operation did a keratitis light up. Two hundred and twenty-nine of these 270 cases were among the laboring class and forty-one among the upper classes. Of these ninety-two were complicated with corneal trouble, and seventy-one with serpent ulcer, or a proof of how often among this class of patients dacriocystitis is associated with corneal involvement.

Treatment of Trachoma with Cuprocitrol.

BOCK, EMIL. (*Wochenschrift für Therapie und Hygiene des Auges*, No. 21, 1903.) Bock analyzes fifty-eight cases which he treated with cuprocitrol. The details of his communication may be omitted and the following are his conclusions. He thinks the product is a valuable addition to our armamentarium giving in fresh cases quite as good results as either nitrate of silver or blue stone. In advanced cases especially when associated with cicatricial

formation and pannus cuprocitrol is far and away the best remedy we have, being prompt and permanent in its effects. The application of the remedy is not attended with any pain. There is no breaking down of the epithelium and the use of it does not interfere with the business of the patient. Even eyes which are irritated by its use are not at all seriously hurt. It is quite possible for the patient to conduct the treatment at home and allow the physician to inspect the eyes once a week. It is especially valuable in those sections where ophthalmologists are inaccessible. The remedy is prescribed in a five to ten per cent ointment in compressible tubes. It is introduced into the conjunctival sac on the end of a glass rod and then gentle massage is practiced. Slight lacrimation and redness follow but these soon disappear. Bock employs these applications twice daily.

Cocain.

PROF. FUCHS. (*Wochenschrift für Therapie und Hygiene des Auges*, 22, Jan. 1903.) Fuchs calls attention to some of the therapeutic uses of cocain at the same time he reminds us that it is not always a harmless agent. When using it for either operations or removal of foreign particles from the cornea he makes the patient keep the lid closed. In operations upon the lids he injects the cocain under the skin and when operating upon the muscles he injects it into the conjunctiva. Even in operations upon chalazia he injects the cocain right into the chalazion. He uses it in the photophobia seen in phlyctenular conjunctivitis and keratitis. He does not allow the patients to use it but applies it himself. He has noticed that the photophobia will soon disappear if he can get the children to keep the eyes open for a short time every day for a few days and this he accomplishes by instilling a few drops of the cocain into the eyes in the morning when the photophobia is usually most intense. This will enable the little patients to keep the eyes open for half an hour or even longer. This seems to break the spell so to speak.

Subconjunctival Injections of Hetol.

LOCENIUS. (*Deutsche-Medizinal Zeitung*, 13, Nov. 1902.)

Locenius has been trying subconjunctival injections of hetol for some time in the St. Petresbury Eye Clinic. He first cocainizes the eye and then injects under the conjunctiva 0.5 cc. of 1 per cent. solution of cocain. There is always more or less pain which lasts from one to two hours, and is followed by a feeling of comfort. Generally speaking in addition to the injection of hetol the proper constitutional treatment was employed and when necessary atropine. In lupus and in keratitis dendritica there was a hastening of the healing process and diminution of pain. Corneal ulcers were always benefited when there was no collection of pus in the anterior chamber. In injuries of the cornea it soothed the pain. The course of parenchymatous keratitis was greatly shortened and the danger of iris complications much lessened. In pannus in combination with atropine it is an admirable alleviator of pain. In inflammation of the uveal tract it is most valuable, as it stimulates the lymph circulation and in this way helps to bring about the absorption of the clouding in the media. Purulent inflammation of either cornea or uveal track are contraindications for the use of hetol. In episcleritic it eases the pain and promotes the absorption of the corneal cloudings.

Sympathetic Ophthalmia.

ROEMER. (*Archiv. für Ophthalmologie*, LV. Band, 2 Heft.) The author reviews in a critical manner all the theories and important works on sympathetic ophthalmia and makes the statement that no satisfactory explanation of the pathogenesis has yet been given. He holds that the disease is due to an infection which for the eye is pathogenic but which is indifferent so far as the rest of the body is concerned, and which reaches the other eye by metastasis. It may be that the organisms concerned belong to the well-known group of saphrophytes. His opinion is that the infection reaches the other eye by way of the circulation. This theory Römer thinks explains satisfactorily the clinical aspects of the disease. The organism of course has not yet been discovered. He calls attention to the fact thatluetie retinitis and papillitis are true samples of infections which have reached the

eyes through the general circulation, and he places in this category of non-traumatic inflammations sympathetic iritis, papillitis and iridocyclitis. The article is an exhaustive and valuable one.

Syphilitic Inflammation of the External Ocular Muscles.

HOCHEIM. (*Archiv. für Ophthalmologie*, LV. Band. 2 Heft.) The case upon which these observers have based their conclusions was one in which there was edema of both the lids and in which there was marked limitation in the movements of the eyeball. On the left side there was ptosis. There was particularly an ophthalmoplegia. The patient was a woman who had suffered for some time with attacks of tachycardia. Careful anatomical examination was made of the eye muscles and important interstitial changes were found. The changes could have been caused by either tuberculosis or syphilis leaving out the injuries. The absence of tubercles and of cessation as well as the negative results of tubercle staining methods would exclude tuberculosis, while the peculiar mixture of cicatricial processes with fresh proliferative processes as well as the fat metamorphoses which were everywhere present in the foci of inflammation speak for the existence of a luetic myositis and that too in spite of the negative results which followed the use of mercury. The author found great numbers of giant cells and inflammatory foci a process which naturally belongs to an inflammation of this character.

Senile Cataract.

DR. MANZ. (*Munch Med. Wochenschrift*, 1903, Nos. 2 and 3.) Manz analyzes two thousand cataract extractions which he has performed during the forty years of his practice. In the early days of his work he was in the habit of performing reclinatio even after extraction had been introduced because the latter was regarded as more dangerous in those days. Of the numerous conditions held as contraindications for extraction and as rather in favor of reclinatio in those days only four have come down to us and they are; advanced age, an extremely nervous patient, fluid vitreous and an intractable conjunctival affection. Manz reports cases in which the

patients were eighty years of age. Several cases of death are reported during the after treatment, either as a result of vascular or cerebral disease, also from hypostatic congestion of the lungs. One should consider the factor of insanity in operating for cataract upon very old persons. The soft diet which was habitually given in old times is still the order of the day. Manz uses a 2 per cent. solution of cocain, and he did not find that stronger solutions produced better anesthesia. He is opposed to the suggestion of Mooren that a preparatory iridectomy should be done and the cataract removed later, because many patients after the preparatory iridectomy finding their sight no better become so depressed that they refuse to allow a second operation, and he thinks that it makes the section with the cataract knife more difficult. He makes the preparatory iridectomy exceptionally.

The Action of Cantharides upon the Eye.

RICHARD, DR. (*Wochenschrift für Therapie und Hygiene des Auges*, No. 25, 1902.) The author reminds us that Leber first described the changes produced upon the eye experimentally. He quotes a case reported by Linde and shows points of difference between the latter's case and the following which came under his own observation. The borders of the lids were much reddened and the eyelashes were covered with a thick secretion and there was considerable photophobia. The palpebral conjunctiva was bluish red in color and thrown into folds. The ocular conjunctiva was much injected and there was also much ciliary injection. The corneae and irides grayish and infiltrated and were evidently deeply involved. The pupils were narrow and the patient complained of great pain. Under treatment which consisted for the most part of atropine hot applications, and bandage he soon recovered. In Linde's case the changes were limited to the cornea and conjunctiva while in Hilbert's case the changes reached much deeper.

Adhesion of the Upper Transition Fold Between Cornea and Conjunctiva, Following A Severe Attack of Gonorrheal Ophthalmia.

LEESER, DR. (*Contrablatt für Prak. Augenheilkunde*, March, 1903.) The case was one where there was

a growth between conjunctiva and cornea a condition which is usually known as pseudo-pterygium, which sometimes follows an attack of blenorrhea of the conjunctiva but very rarely, and more often is seen after diseases and injuries of the cornea. The condition which was encountered here differed from the usual form of pseudo-pterygium seen after acute blenorrhea in that, in the latter form, we have a more or less extensive conjunctival fold springing from the eyeball bordering on the limbus and attached generally very fast to a point in this location. One can readily pass a probe under the fold. The condition described by Leeser differs from the above in that the point of origin and the point of attachment at the cornea were not in the usual location. The conjunctival fold was attached to the cornea it is true but at the same distance from the border of the cornea and the central end of this fold reached up to the pupillary area. This fold did not spring from the conjunctiva bordering on the limbus but from a point far above, in other words, from a point where the conjunctiva of the tarsus and of the upper transition fold pass over into one another. This deviation in the picture from the usual pseudo-pterygium suggests naturally a different origin. The case was operated upon and the corneal cloud which remained did not cause any very marked disturbance in vision. When the mass was separated from the cornea it sprung back suddenly under the upper lid and it could not be seen with the eye wide open. The mass shrivelled up and disappeared.

Dacryocystoblennorrhea of the New Born.

HEIMANN, DR. E. A., Charlottenburg. (*Deutsche Med. W.*, 1903, No. 5.) He recommends massage of the tear sac for several week. If not successful, the lower canaliculus must be slit and probes introduced which, by screw movements, will penetrate the congenital atresia in the lower portion of the lacrimal duct, and thus effect a cure.

Paralysis of Accommodation.

HELBROH. DR. JOSEPH. (From the University Eyeclinic of Berlin, *Berl. Klin. Woch.*, 1903, No. 6, p. 120.) Out of about 300,000 eye patients, treated during the last two and a half years, 103 had paralysis of accommodation, of

which 27 were unilateral, 57 bilateral. The first and second decades of life were predominating. With the exception of 10, the etiology could be ascertained in all. H. considers them under three groups: 1, affections of the nervous system; 2, infectious diseases; 3, intoxications.

Two of the first groups occurred in encephalitis, one in a boy, aged 10, with bilateral papilitis due to cerebral tumor, two in dementia paralytica, four in total paralysis of the third nerve from basil meningitis of which three were luic, one tuberculous. According to Leyden and Goldscheider, 40 to 50 per cent. of patients affected with locomotor ataxia have one or the other ocular palsy in any stage of the disease. Of H.'s patients one had isolated unilateral paralysis of the ciliary muscle, one bilateral with reflex immobility of the pupil, two unilateral, three bilateral, and two complicated by palsies of other ocular nerves. If lues and locomotor ataxia are combined, the nature of the palsy is difficult to discriminate. One occurred in disseminated sclerosis, and one case of recurrent paralysis of the third nerve, existing for eight years, in a boy, aged 15. Two cases of hysteric paralysis of accommodation may have been only high degrees of accommodative asthenopia. Two cases of isolated, partial, bilateral paralysis of accommodation in two girls of 26 and 15, of whom the latter had a peaked skull, probably from former hydrocephalus, apparently were congenital and due to infantile nuclear atrophy. In a girl aged 14, who suffered from akrocyanosis chronica anæsthetica, the bilateral partial paralysis of accommodation was perhaps due to poor circulation, from the spastic condition of the carotid, damaging the nucleus of the third nerve. In syphilis, accommodation was exclusively paralyzed unilaterally four times, bilaterally twice, associated with pupillary disturbances. unilaterally in three, bilaterally in four; with other ocular palsies, five times unilaterally, once bilaterally. 31 cases of paralysis of accommodation in both eyes occurred after diphtheria. One was complicated by paralysis of the sphincter and three by paresis of abducens. In 14 of these it was total. The prognosis is generally good but the trouble may subside incompletely, as it still existed in one patient after

three-fourths of a year and in another after three years. All patients were hypermetropic, except four, of whom three were emmetropic and one myopic, which may be construed in favor of the explanation given by Bernheimer that the paralysis is the result of straining the muscle of accommodation, weakened by the disturbed metabolism during convalescence from diphtheria.

Experimental Researches on the Action of Subconjunctival Injections.

WESSELY, DR. C., Berlin. (*Deutsche Med. Woch.*, 1903, No. 7.) W. doubted the alleged action of subconjunctival injections as being due to lymphagogenic influence and attraction of leucocytes. By experiments on rabbits he found

1st. That the injected solutions were rapidly diluted from transudations of water from the conjunctival blood-vessels. A 5 per cent. solution of nacl, e. g., contained only three-quarter per cent. after half an hour. Very little of the substances reached the interior of the eyeball. After subconjunctival injections of 1 cc. of a 20 per cent. solution of ferrocyanide of potash the aqueous contained 1:1000, the vitreous 1:2,000,000.

2nd. The subconjunctival injections do not accelerate the osmotic current of the anterior chamber but act on the ciliary vessels, apparently through reflex, just as mechanical irritations of the conjunctiva in such a way that the aqueous humor, otherwise almost free from albumen, will now contain albumen up to 1 per cent. Thus they are nothing but a strong irritant, which, through hyperemia and its consequences, may convey to the eye the protective substances of the serum in large quantities. Therefore they would be practically indicated in chronic conditions lacking sufficient inflammatory reaction.

Naevus Pigmentosus of the Conjunctiva and Cornea.

OPPENHEIMER, DR. EUGENE, Berlin. (*Ibiden*, p. 143.) A very large melanoma of the conjunctiva and occupying two-thirds of the cornea, smooth, lobulated, soft, 1 mm. thick, not movable, intensely black, made, at a first glance, the impression of a melano sarcoma. It occurred in a man 75 years old, who had it since birth. It never grew and remained benign.

Diagnostic Value of the Old Tuberculine in Parenchymatous Keratitis.

ENSLIN, DR. (From the eyeclinic in the University of Breslau, *Deutsche Med. Woch.*, 1903, N. 8.) At the instance of Prof Uhthoff, E. injected all (24) cases of parenchymatous keratitis, which came to the clinic during the last few months, without exception, with tuberculine, (according to the directions of Koch). In all cases (save one which was not clear) in which no re-action followed, hereditary lues could be proven and in those which reacted typically, other signs of tuberculosis could be found. E. advocates tuberculine injections, with proper care, are harmless, in doubtful cases as a diagnostic means.

Twelfth Report of the Eye Department of the State Hospital at Laibach.

BOCK, DR. EMIL, Primarius. From January to December 31, 1902, 1273 new patients, altogether 1333 were treated. 512 operations were performed, of which 104 were cataract operations, 103 iridectomies, 24 for prolapse of iris, 2 for myopia with good sight, one extraction of a foreign body from the interior, 20 enucleations, 15 extirpations of the tearsac. The results were very good. In none of the cataract operations suppuration occurred.

ABSTRACTS FROM DUTCH OPHTHALMIC LITERATURE.

BY

E. E. BLAAUW, M. D.,

BUFFALO, N. Y.

(Quarter ending March 31, 1903.)

Transactions of the Twenty-second Meeting of the Netherlands Ophthalmic Society at Utrecht, December 14, 1902.—Thirty-one members and one guest present, presided by Prof. H. Snellen, Jr.

A Case of Vena Optic Ciliaris.

VAN GEUTS, DR., demonstrates a patient with the abnormal vein, which had formed only recently.

Ophthalmoscopically visual connections between the circulatory apparatus of the optic nerve and retina on the one side, and the uvea on the other side, are much more frequent between arteries and veins. Leber demonstrated fine vessels going from the chorioidal margin of the papilla and the optic sheath, lamina cribrosa, papilla and the directly surrounding part of the retina; a venous analogue of these vessels is present. The observed cilioretinales are nearly always direct or indirect branches of the circulus arteriosis N. Opt. of Zinn (Elschnig). A seven year old boy was examined ophthalmoscopically for the first time on October 22 by Dr. van Geuns. He had been treated in the University clinic at Leiden and also examined with the ophthalmoscope at that time, that special care was used in detecting abnormal vessels; the last time on July 30, when no vestige of opitco-ciliary vessel could be noticed. Patient became sick in Sept., 1901, with heavy headache and vomiting spells. His gait was already of a staggering character during a few years, which now became worse; the speech also became slow. Prof. Rosenstein diagnosed a probable brain tumor. On Nov. 21st pronounced papillitis of the left eye with little swelling of the papilla; slight papillitis of the right eye.

On Dec. 2nd hemorrhages were found on and surrounding the papillae. The papillar swelling on Feb. 5, 1902, is 2 mm.; less hemorrhages. On June 26 no more hemorrhages, papillae slightly atrophic. July 30, V. O. D. S.: 5/6 at 6f., with + 1.50, papillae atrophic, no more hemorrhages, arteries small, veins dark. At the temporal side of the left papillae small exudates in the retina. During the following November, V. O. D. S. 5/10, with +1.50, slight nystagmus, which disappeared. The papillae are pale, with radiated lines, indistinctly limited, and slightly swollen, the vessels partly hidden through connective tissue formation. The veins are dark, moderately thick, not tortuous, the arteries nearly normal. From the middle of the papillae near the exit of both the chief branches of the vena centr. a broad, dark colored vein, the caliber of which is not smaller than the other chief branches, appears, which goes in the form of V or W toward the temporal margin of the papilla and disappears in the depth. Somewhat higher up a muscular vein dividing in two branches, with a small exudate patch between, will be seen, while on the papilla a small blood-vessel with peculiar course and doubtful connection with the venula is found. In the left fundus also some anomalies are found. On the papilla, in a beginning neuritic atrophic stage, two small vessels probably venulae, go out from the center and can only be followed to the margin. Van Geuns believes the under one to be also a vena optico-ciliaris, less clearly developed than in the right eye.

We might suppose with certainty that this thick vein has developed from out the pre-existing small venous anastomosis between the chorioidal vessels and the small branches given off by the V. Centr. for the papillary tissue, which carries the venous blood for a large part, if not entirely from out the retina toward the chorioid, because the discharge through the V. Centr. is obstructed. It is surprising that not more often a V. Optico-ciliaris forms with an obstructed circulation in the V. Centr.

Aniridia Congenita Bilateralis.

VAN GEUNS, DR., demonstrates a patient, 35 years old, with this defect. She was when 9 years of age examined in the Leiden clinic. She always had poor vision; her

father suffered with his eyes, and died blind when patient was a child; her mother and younger sister have normal eyes; brother pretty good eyes; the oldest sister always had bad eyes, but different from patient—one eye became blind through an ocular disease. Three years ago a veil began to form before the right eye, and, since half a year, also before the left. Van Geuns found a mature cataract in the right eye, in the left pointed, probably congenital, opacities with a more diffuse obscuration. V. O. S. 5/50. After simple flap extraction with scleral section the right eye showed V., with $+11 D = 5/36$, and could read Sn. 1.25 at a distance of 15 cm. with $+15 D$. In the left eye the lens margin can be seen, processus ciliaries invisible. Nystagmus and slight ptosis are present.

The Gonococcus-coloring After Pappenheim.

VAN GEUNS, DR., changed Pappenheim's method as described in Abel's *Taschenbuch für den Bacteriologischen Praktikanten*. Van Geuns keeps his stains in solution: pyronine 1 gram, alcohol 96 per cent. 10 cc., aq. dest. 90 cc. The solutions are filtered. As the pyronine dissolves only partly a residue remains behind on the filter. When a preparation must be stained one part of the pyronine sol. with two parts of the methyl green sol. and two parts distilled water are mixed. It might be heated. A few months old pyronine sol. colors stronger and less elective. In that case v. G. uses one part of the pyr. sol., four parts of the methyl green sol. and 6-8 parts aq. dest. and heats above the gas flame. The gonococci will be ruby-red, the cell nuclei dark blue, the plasma of the leucocytes very light blue and the plasma of epithelial cell pink or light violet.

The coloring method of Gram is used as control.

The methyl green solution is made up as follows: methyl green 1 gram, alcohol 96 per cent. 10 cc., aq. dest. 90 cc.

The Musculus Papillae Optici (Illustrated).

NICOLAI, DR., refers to his previous communication (vide. *Annals of Ophth.*, Jan., 1903, p. 181). He could separate some intact cells after maceration of small pieces of the optic nerve in a 35 per cent. hy-

dras kal. sol. for 30 minutes. They look like smooth muscle cells; the length of the nucleus is on an average 20 mikra; they are similar to those of the musc. ciliaris, treated in the same way. Prof. Engelmann advised N. to use the staining method of van Gieson and to stain with palladium chloride as a method of differentiating connective tissue in its different forms from smooth muscle fibres. With van Gieson's stain the smooth muscle fibres remain lemon-yellow, with palladium chloride straw-yellow. As with van Gieson's method the nerve and neuroglia tissue are colored yellow, the decision remains with the shape of the cells. The staining after Weigert decided against neuroglia tissue. This muscular tissue can not be the same as the elastic tissue found in the same place by Sattler, as this ought to stain red and not yellow, and as elastic fibres never contain nuclei.

DISCUSSION.

Dr. Schoute thinks that N. went too far, when he spoke of a musculus. He can only speak of cells very similar to muscular tissue, within the pap. N Opt. It is the same story as with the musc. dilat. pupillae. The histologists considered it to be elastic tissue, because it reached to all the then known reactions of elastic tissue. Later however it proved to be muscular-epithelial tissue. S. cannot fancy a muscle in the papilla. As small tumors atrophy the nerve fibres through small pressure, the muscle of Nicolai must do this far easier, because when it acts it must more or less "strangulate" the nerve fibres and atrophy them. A healthy functioning muscle and a healthy papilla is a physiological impossibility.

Dr. de Vries mentions that O. Lange has found smooth muscle fibres in the optic nerve in a microphthalmus.

2. That it is strange that this muscle should be the only smooth one in birds where all ocular muscles are striped.
3. That as every muscle possesses an antagonist all fibres act here in the same direction. Does N. consider the musc. ciliaris antagonistic to the M. Pap. Opt.?

Dr. Struycken thinks that contraction of the muscle of N. does not necessarily compress the papilla. If the muscle arises from the sclera it would loosen the papilla with contraction.

Dr. Tuyl asks if the smooth muscle fibres perhaps originate from the nearby blood vessels.

In answering Dr. Nicolai says: First, the question is, "is it a muscle," the question of function comes later. The muscle must be considered as a contractile membrane with many openings which do not necessarily need to become smaller with contraction. Dr. N. did not examine this tissue in birds eyes. He considers it the antagonist of the M. ciliaris. Many blood vessels are present, but are easily recognizable; the direction and the number of his muscle bundles speak strongly against the possibility of their coming from these blood vessels.

Glioma and Pseudo-glioma.

DR. DE VRIES relates the four cases of glioma retina which he found in the 34,000 patients that visited the university clinic at Amsterdam since 1895.

Examination of the enucleated eye of a 3 year old girl showed the optic nerve to be infiltrated; resection of a piece of the nerve; later evisceration of the orbit; died within half a year. 2nd case, 4 year old girl. The diagnosis was tuberculosis chorioiditis on account of inheritance, isolated knots in the fundus and absence of detached retina. A cataract prevented further seeing until pain and staphylomatous formation necessitated enucleation; later exenteration orbit; child died. Case 3, 7 year old boy. Enucleation after the mother noticed the fundus reflex. This glioma showed much calcification. Optic nerves free. Two years later the child is healthy. The other eye is normal. Case 4. A 2 year old girl had glioma of both eyes. Right eye was enucleated in the stage of secondary glaucoma, with a good piece of the optic nerve. The angle of the anterior chamber was partly closed, optic nerve free, only the physiological excavation was overgrown with tumor tissue with many nuclear divisions. No local recidiv. after two years. After recovering from this operation, when the child could be handled again, two knots were seen next to the pap. N. Opt. The mother noticed only one and one-half years later a reflex from the fundus and a failure of vision; after five months the second eye was enucleated (two years after the first eye), the optic nerve also was free; three months thereafter no recidiv.

The diagnosis of glioma is difficult. It cannot be recognized as in case 2, and in those cases where cataract and corneal opacities prevent observation. But also other affections are considered to be glioma, i. e., simple ablatioretinæ, leucosarcoma choriodeæ, tuberculosis chor., chronic and acute inflammations, cysticercus, congenital malformations. Under these pseudogliomara purulent hyalitis, especially the insidious form, is most frequent. Dr. Smit presented such a case where a few synechiæ were found as the only deviation from the common diagnosis of glioma. A large purulent exudate was found in the vitreous body which was partly organized from out the corpus ciliare; also ablatio retinæ and total synechia posterior present. The shrinking of this new formed connective tissue at the lens equator had changed the shape of the lens to that of a lenticonus posterior. Dr. Waller Zeper sent him another case where he had found next to a coloboma irides a white mass behind the lens, over which coursed a blood vessel. The process was progressive. Patient was 10 months old, small for his age, the youngest of six children, all healthy. Tuberculosis, syphilis, rheumatism were absent in the family. The bulb was of normal size and form; some strings go from the corpus ciliare toward the posterior surface of the lens from where a thin thread, the art. hyaloidea, goes to the optic nerve. These strings are of different kind, laterally a duplication of the inner fold of the eye-vesicle goes to the posterior surface of the lens, the medial string looks like an enormously stretched proc. ciliaris, while the strings within the coloboma are formed by a double epithelial layer with connective tissue at its front side which connective tissue goes over in the (connective tissue) cone behind the lens and at the opposite side in the connective tissue of the iris and corp. cil. Blood vessels go from this cone toward the corp. cil. and this tissue simulated a glioma, perhaps a partial obscuration of the lens had something to do with it. The art. hyal. is enveloped with a sheath of connective tissue with long nucleia, which widens at circa 2 mm. before the opt. nerve forms a cone, which rests with its base on the inferior nasal quadrant of the papilla. Two branches go from the art. hyal. before entering the opt. nerve which follow the wall of the cone until the retina, in

which they divide. Oftentime a cone, resting on the papilla and out of which retina vessels come, has been seen clinically (Hirschberg, Jaenner, Everbusch, etc.). They are often considered as the visible canal of Cloquet. This connective tissue sheath could be a condensed wall of the canal Cloquet. The observation here shows next to this connective tissue sheath around the art. hyal., also the canal of Cloquet. "A visible canalis Cloqueti" should disappear from our diagnostic table. Treacher Collins found four times a congenital malformation, where glioma was diagnosed; he found here that with indirect light something existed which resembled glioma, but that a reflected red light came from the fundus around this nearly centrally located opacity. This eye shows all symptoms of a microphthalmus, except its size which is 20 mm. The progression, which Waller Zeper noticed, resulted from a progressive cataract of the posterior cortex.

On a question of Prof. Koster, de Vries says that he supposes, that during the development of the eye an influence acts, which leads to inflammation in more developed organs. Different changes, which speak for it, are found in microphthalmus.

The Connection Between Illumination and Refraction.

SCHOUTE, DR., mentions Charpentier's observation, who found that his myopia increased in twilight about two dioptries; by exclusion Charpentier accepts a forward motion of the retina, when the eye is strongly illuminated, through swelling of the chorioidal vessels. Charpentier found that Beraneck and Verrey had expressed this same hypothesis as an explanation for the diminution of the refraction on the one eye when light is thrown in the other. These observers computed that Engelmann's cone-motion is too small to explain these phenomena. Motais examined a number of typographers and found there many myopes, he found them to have in the evening a myopia of 0.50—1.00, D. more, and an accommodation spasm, the result of the day's work. Schoute can not agree with this. He rather likes to put this phenomenon on the same line with Charpentier's. Van Der Hoere accepts (Rosenstein's bundle) a filling of the chorioidal vessels so that a noticeable refraction change can arise,

while Prokopenko rejects this, who describes the chorioidea as a complex of elastic fibres appointed as a support for the blood vessels and taking charge against over-filling.

The question: "Is the refraction stable or not" is of itself of much importance, but increases as it is of much influence for our interpretations of other subjects, we shall have to think quite differently of the connection between illumination and vision, when the refraction shows itself to be a result of the illumination; so also the pseudo-accommodation of the aphaxic eye could be explained with Ch.'s accommodation-mechanism.

Schoute found that his refraction of both eyes did not change at all with less and less illumination, even till the vision became little as 8/60. Sch. asks the members to verify Ch.'s results and to use a gradual diminution, not going with bounds.

Prof. Snellen, jr., thinks that as the seeing in twilight costs much exertion, this could mean a contraction of the external ocular muscles, which contract and lengthen the bulb.

Retrobulbar Abscess.

DHONT, DR. A. M., relates the following case: A 6 years old girl left eye began to bulge after pneumonia; it increased slowly. Eight days later the child came to the clinic at Utrecht. The left eye was markedly protruded, straight farward with ptosis of the upper lid; motility nearly lost, except a small rotation around the sagital axis. Pupil a little wider, reacts to light; the fundus normal, with the exception of somewhat dilated vessels V. = O. IV. O. D. = 6/10. Before the left ear a swollen gland. No fluctuation nor circumscribed tumor to be felt behind the eye, the entire surrounding is equally firm; rectal temp. 37.6°, pulse 92. The other organs normal. Diagn.: retrobulbar abscess. Treatment: Wet bandage. During the next day a slight chemosis supervened and the protrusion increased. Under narcosis three incisions were made, temporal up and down and one nasal down; out of this last one, just an idea of pus escaped. The following evening temp rose to 38.2° and three days later the conjunctiva was lifted by pus in the lower temporal part.

Incision. Inoculated glycerine-agar gave abundant colonies of *staphylococcus pyog. aureus*. The original three incisions always kept dry. Temp. became normal, protusion and chemosis subsided. The immobility and ptosis remained. Treatment: Electricity and iod-of-pot.; immobility disappeared slowly, remained only upward. Vision remained zero, a pronounced pap. alba could be seen.

A week after this patient left the clinic a farmer, 25 years old came, who five weeks previous had had an inflammation of the skin of the nose, showing redness, swelling and general malaise. A small pus vesicle opened at the root of the nose. The process healed within four weeks. Then however the family noticed a protrusion of the right eye. He has headache in the supraorbital region, is for the rest healthy; the bulb is moderately protruded forward and downward. Movement downward and upward is nearly entirely lost. Cornea slightly infiltrated V. = 3/60. Eye for the rest normal, except slightly dilated episcleral vessels. No circumscribed tumor, neither fluctuation to be felt behind the eye. Right nose hyperemic. Temp. 36.9. Other organs normal. Diagn.: Abscess, perhaps retrobulbar tumor. Under narcosis deep incision at the upper side of the orbit, which shows a solid tumor connected with the bulb. Diagn. now sarcoma orbitæ and four days later exenteratic orbitæ. The tumor is situated between the muscles, in connection with these and the posterior wall of the bulb; its diameters are 22.27 and 38 mm. The optic nerve passes through the tumor, but is macroscopically normal even as its sheath. Microscopically it is doubtful if it is sarcoma; it looks more like granulation tissue developed in the place of an abscess. Still the appearance of such a large tumor in the short space of five weeks is very suspicious.

Dr. Nicolai removed, in a case of retrobulbar tumor, a small piece for examination and observed afterward the disappearance of the protrusion and disturbance of the mobility. It was a neurom of the optic nerve.

ABSTRACTS FROM ENGLISH-COLONIAL OPHTHALMIC LITERATURE.

BY FRANK ALLPORT, M. D.,

CHICAGO, ILL.

(Quarter ending March 31, 1903.)

Some Unusual Forms of Ocular Traumatism.

STIRLING, T. W., M. B. (*Montreal Med. Journal*, Jan., 1903.) 1. Traumatism of roof of orbit with evulsion of eyeball. A laboring man fell twelve feet and struck an iron crowbar standing upright in the ground, the point entering the left orbit. The lids and soft orbital tissues were mangled. The eyeball was unruptured, but was dislocated so that the upper posterior surface presented outside the torn eyelids, the cornea being directed toward the floor of the orbit. The upper bony margin of the orbit gave distinct crepitus. For fear of sudden uncontrollable hemorrhage on clearing out the orbit, the left common carotid was ligated. The optic nerve was found to be ruptured and the roof of the orbit broken into a number of pieces. The fractures involved the nasal, frontal, sphenoidal, and ethoid bones.

The patient recovered in three weeks.

2. Steel in the vitreous removed by electro-magnet with useful vision resulting.

The patient two hours before examination was struck by a piece of steel which entered the eyeball. There was great pain and vision was reduced to light perception.

Upon examination it was evident that the steel had entered through the cornea, penetrating the iris, leaving a small opening, and escaping the lens, had lodged in the posterior chamber. The pupil was irregular, being a horizontal oval. The posterior chamber was filled with blood, so that no details of fundus could be seen by the opthalmoscope. An incision was made through the coats of the eye between the insertions of the external and inferior rectus about seven millimeters from the cornea. Through

this wound a Snell's electro-magnet was passed and on the third attempt a piece of steel one-fourth inch long was withdrawn.

The wound healed and three months later vision was one-third normal, but there was a scotoma in the inner part of the field corresponding to the scar left by the incision. On ophthalmoscopic examination there were lymph specs in the vitreous and a white scar to the outer side the incision was made.

3. Impaction of a small piece of steel in right cornea, penetrating all its layers and projecting into the anterior chamber.

Four hours before examination patient had been struck in right eye by piece of steel. In the center of the cornea was a small gray spot about the size of a pin head, and from this the piece of steel could be seen projecting into the anterior chamber. It could not be removed from the outside and to make any pressure on it would force it into the anterior chamber. A broad bent knife was passed into the anterior chamber so that the flat side would be behind the steel to support it, then with a needle the steel was gently loosed and with an electro-magnet removed.

There was rapid healing and normal vision.

4. Cataract following an electric shock from a live wire.

A boy was struck over the left malar region by a live wire. He was senseless for an hour and artificial respiration had to be performed.

Vision at the time of injury was perfect but it gradually began to fade, so that in the course of a few months, useful vision was lost. There is a scar over the left malar prominence corresponding to the burn, but not reaching the eyelids. There is a pale bluish-white cataract. There is perception of light but the projection is uncertain.

Section of the Eye, a Substitute for Enucleation.

HALL, ERNST A. (*Montreal Med. Journal.*) The object is to remove the ciliary region in front because here is the principal place for traumatism and sepsis which leads to loss of function; and the sclero-optic junction because through this is the conveyance of sympathetic and septic trouble to the other eye. With these parts and the retina and

vitreous removed, the remaining parts should be nonirritating and harmless. The sclerotic zone thus left with muscles attached and motor nerves undisturbed is, a movable pad for the artificial eye.

The technique of the operation is as follows: The scissors are inserted about 25 mm. behind the sclero-corneal junction, sufficient to include the ciliary body and complete section is made, so removing the whole front of the eyeball. The vitreous is then evacuated and the retina and choroid removed by curet. The hemorrhage here is profuse but controlled by hot water and pressure. Then the speculum is inserted within the ball and so made to hold the eyelids and edges of the sclerotic opening. The optic nerve is grasped with toothed forceps and scissors or a long slender knife, inserted as close as possible to the nerve to avoid wounding the ciliary arteries, and a circular incision made in the sclerotic freezing the optic nerve. The nerve is then drawn forward and severed about 25 mm. from sclerotic junction. A piece of gauze is inserted and the sclerotic and conjunctiva closed vertically so as to give normal tension to the internal and external recti.

The gauze may be removed in twenty-four hours. The cavity fills with blood which becomes partly organized and so prevents collapse of the sclerotic. An artificial eye can be worn in two weeks. No sloughing of the sclerotic and no sympathetic irritation follows. The fuller pad gives prominence to the artificial eye, and there is a wide range of movement.

Rheumatic Conditions in Organs of Special Sense.

ORR, T. ORLANDO. (*Dominion Med. Monthly.*) In a symposium on rheumatism, Dr. Orr says: In the eye we have eczematous conditions of the lids and cornea that may be due to rheumatic virus, although I think this is improbable. However, paralysis of the external ocular muscles is undoubtedly caused in many cases by rheumatism.

Of the diseases of the eye none can be so directly attributed to rheumatism as certain forms of iritis, especially that form which is characterized by severe pain and which recurs, with regularity at certain periods of the year. It occurs mostly in chronic rheumatic patients. It has a great tendency to relapse under the slightest provocation, and may occur in one or both eyes. It yields readily to treatment and recovery is complete without any ill results especially if at the outset means are taken to prevent the formation of adhesions of the iris.

ABSTRACTS FROM AMERICAN AND ENGLISH OPHTHALMIC LITERATURE.

BY

CHARLES H. MAY, M. D.,

NEW YORK,

AND

NELSON M. BLACK, M. D.,

MILWAUKEE.

(Quarter ending March 31, 1902.)

An Operation for Atropic (Cicatrical) Entropium of the Lower Eyelid.

EWING, ARTHUR E., St. Louis, Mo., (*Amer. Jour. Ophthalmology*, Feb., 1903.) The author's procedure is a development of that suggested thirty years ago by Dr. John Green for similar affection of the upper lid. The essential feature in this operation is a longitudinal incision through the tarsal conjunctiva and the tarsus, parallel to and from two to three millimetres distant from the line of the opening of the Meibomian glands. "This incision, extending through the entire thickness of the tarsal tissue from its nasal to its temporal end, permits the whole marginal strip to be turned forward, to form a new lid margin of normal width and appearance; the gaping cut on the conjunctival aspect of the lid becomes filled with new tissue by which the height of the tarsus is permanently increased often as much as three millimetres." In the case of the lower lid, the operation left much to be desired, owing to very great difficulty in keeping the tarsal incision widely open during the progress of the healing. To obviate this difficulty, Ewing devised the plan of dissecting the tarsal conjunctiva from the tarsus, from a little behind the openings of the Meibomian glands in a width of about five mil-

limetres, and stitching the loosened conjunctiva into the bottom of the tarsal incision. Since reporting his procedure in 1900, he has made several improvements in the way of simplifying the operative technique, and in the manner of inserting the sutures.

As an aid in everting the lower lid, the writer employs a modification of the *pince-anneau* of Desmarres, the fenestrated blade of which is made to engage the conjunctival surface at a distance from the lid-margin intended for the tarsal incision, usually 2 to 2 1/2 mm.

"The screw may then be tightened," or the forceps may be held firmly in position, while making the incision, which should be the full length of the lid and parallel with its margin. Care must be exercised not to cut entirely through the lid, and not to place the incision too far from its margin. In the latter case an excessive eversion might result. If, upon examination, the incision is found to be incomplete, it may be finished with a Graefe knife or a small bistoury. To do this easily and thoroughly the forceps may be removed, the blades closed with the fenestrated blade upward, and (thus closed) again placed against the lid as was done with the spatula blade in the beginning. The margin of the lid is in this way rolled forward over the wire of the fenestrated blade, and, with the spatula blade serving as a support, the incision may be followed and deepened. It should be carried through the tarsus and underlying fascia, down to or a little into the muscular layer of the orbicularis, so that the muscle is exposed throughout the entire length of the wound."

"After the incision of the tarsus has been completed the partially detached marginal strip may be turned forward by means of toothed forceps, but with less injury to the tissues and more effectually by inserting either a single thread near its centre, or two or three threads. By pulling forward upon these threads the incision is drawn widely open, exposing the muscular layer and permitting the accurate placing of sutures, generally three in number, which are passed through the conjunctival edge of the cut, in the standing position of the tarsus, and then through the marginal strip, being entered at the bottom of the wound between the muscle and the detached carti-

lage, to emerge on the dermal surface in or a very little below the line of the cilia. The needle is then re-entered through the skin in the same horizontal line, about three millimetres distant from the first point of exit, and the suture is tied in the conjunctival incision. Should any part of the orbicularis muscles remain exposed, it should be covered by inserting intermediate sutures connecting the conjunctival edge of the standing portion of the tarsus with the bottom of the wound.

The effect of the principal sutures, when drawn moderately tight, is to evert completely the entire marginal strip. The cuticular surface of this strip, which had been previously turned against the eyeball, is brought again into its proper anatomical position, to form anew a palpebral margin of normal width and with a normally defined posterior angle. The exposed tarsus becomes covered with epithelium, to form a conjunctival surface continuous with the standing portion of the eyelid. For the sutures, fine silk (No. 1) carried by fine needles is used. Both should be thoroughly sterilized. After completing the operation, the eye should be thoroughly cleansed with a one-to-five-thousand corrosive sublimate solution, and bandaged, and this should be continued daily until the sutures are removed, usually after from three to five days."

Ewing's first experience with this simplified method of operating dates back eleven months; in four cases there is now an ideal margin, with restitution of the cilia to a normal position and direction. The method has also been used on the upper lid with uniformly excellent success.

Dr. John Green supplies an addition to the paper in which he says that the longitudinal incision of the conjunctiva and tarsus, as a fundamental procedure in operating for organic inversion of the margin of the upper eyelid suggested itself to him as an improvement on the operation of von Ammon. The purpose of limiting the incision to the conjunctiva and tarsus was to conserve the vascular connections of the marginal strip through the orbicular muscle and integument. His contribution to the subject consists "in the insistence on the inutility, or worse, of the excision of any but a very narrow strip of skin; in the contention that such a strip, if excised,

should be taken very near to the margin of the lid, close to the row of eyelashes; in a particular manner of inserting the sutures; and in the employment of contractile collodion, painted along the cutaneous surface of the lid parallel to and near the lid margin, as a substitute in many cases for the excision of even a very narrow strip of integument. This operation, which gives admirable results when performed on the upper eyelid, has been almost always disappointing when tried upon the lower lid. The modifications devised by Dr. Ewing, particularly as shown in the simplified operation now described by him, makes it possible to secure as perfect results in atrophic entropion of the lower lid as have been attained hitherto in operating on the upper lid."

A Method for the Prevention of Symblepharon after Burns of the Conjunctiva.

SNYDACKER, E. F., Chicago. (*Archiv. Ophth.*, Jan., 1903.) "A lead plate, a little less than 1 mm. in thickness, was cut out so as to fit accurately between the lower lid and the eyeball, being adjusted firmly into the lower cul-de-sac, so as to put it on the stretch. Over this plate on the anterior or skin surface of the lid a somewhat larger plate was fitted. Each plate was perforated by four holes. From within outward, through the holes in the plates, passing throughout the thickness of the lid, two double armed sutures were passed. One needle of the first suture was passed through the hole of the inner plate at a, through the thickness of the lid and emerged at a, the other needle passed in at b and out at b, the two ends at a and b were tied moderately tight, so as to hold the plates firmly, but not to exert too much pressure on the lid. The ends of the sutures were not cut, but left hanging; in the same manner the two needles of the other suture entered, one at c, the other at d immersing respectively at c and d; the ends were firmly tied and also left hanging. Each end was then fastened to a strip of one inch gauze, which was completely under the chin, then up over the top of the head passing behind the ear, then drawn again under the chin and so made to encircle the chin and the top of the head five or six times. The bandages were fastened in the desired positions by safety pins; the bandages having

been starched and adjusted while damp, when they became dry had absolutely no give to them, by this method the lid was kept everted."

The author suggests the next time he used the method he will have the inner plate made wedge shaped, the thicker space being forced into the cul-de-sac to press out its folds to prevent subsequent shrinkage. The cornea is protected by the upper lid and a moist gauze pad over the eye. The granulations as they spring up are touched with stick nitrate of silver. The plates were kept in position eleven days.

Operation on the Tendon of the Superior Rectus Muscle for Paresis of the Superior Oblique.

JACKSON, EDWARD, Denver, Colorado. (*Ophthalmic Review*, March, 1903.) The author reports several cases successfully treated and cured of diplopia, headache and vertigo, by what is virtually a transplantation of the tendon of the superior rectus muscle to a point situated back and outward (temporally) from the original insertion.

"When the superior oblique is weakened or completely paralysed a strong effort is made to have its functions performed by the other ocular muscles, the intorsion by increased action of the superior rectus. On the other hand, the superior rectus is inhibited, to prevent the eye from being turned up or in, the superior oblique no longer turning it down and out. If, then, one seeks, by operation on the superior rectus, to aid this process of compensation, he must: First, increase the power of the superior rectus to cause intorsion; second, diminish the power of this same muscle to cause upward rotation of the eyeball; third, lessen the tendency of the superior rectus to turn the eye in, and increase its power of acting with the inferior oblique to help turn the eye out. Those indications are all met by displacing the insertion of the tendon backward and outward.

The backward displacement corresponds to that which would be produced by an ordinary tenotomy, in so far as the power of the muscle to rotate the eye upward is concerned. But the ordinary tenotomy would diminish the power of the muscle in equal proportion for all purposes, and thus would defeat the effort to bring about compensa-

tion. When the insertion of the muscle is displaced outward as well as backward the relations between the different effects produced by a given contraction of the muscles are altered, and a totally different result is secured. The outward displacement of the insertion is like an advancement of tendon, in that it increases the power of the muscle to produce intorsion. It also increases the power of co-operation with the inferior oblique to help turn the eye outward; at least it opposes the tendency of the inferior oblique to cause extorsion, and thus enables it to come somewhat to the assistance of the externus.

The incision begins about 8 mm. back from the cornea, over the nasal third of the tendon, and extends 3 or 4 mm. beyond the temporal margin of the tendon, its temporal end being farther back from the cornea. Through this incision the tendon is raised and isolated on the strabismus hook. A small half-curved needle threaded with fine silk is then entered through the tendon near the nasal border. The needle and sutures are carried beneath the tendon, emerging at its temporal margin. At the point previously fixed upon, the needle is made to enter the sclera. It is carried about 3 mm. in the firm sclera tissue, and made to emerge. After this the needle is passed beneath the temporal margin of the tendon and caused to pierce it and emerge. Now the free ends of the sutures and the loops which are left loose, are drawn out of the way. The tendon is divided close to its insertion and the suture is tightened and tied, bringing the central portion of the tendon in close contact with the sclera. In the loop, about the middle third of the tendon (3 or 4 mm.) should be included; the scleral loop should be slightly less.

The displacement of the insertion should be made to represent double the number of degrees of the deviation to be corrected. Thus to correct an extorsion of 5 degrees (10 centrads) the insertion of the muscle should be carried outward 2 mm. To correct an upward deviation of 10 degrees (20 centrads, a 20-degree sprism) the insertion of the muscle should be carried back about 4 mm."

One Hundred and Fifty Magnet Operations.

FISHER, WM. A., Chicago. (*Ophth. Record*, January, 1903.) No delay should be tolerated when a foreign body

has entered the eyeball. If the object should be iron or steel the magnet should be applied as soon as the patient can be prepared for the operation. The sideroscope may be employed, as its use causes no delay. An x-ray picture only causes delay and this favors infection. We can remove the metal long before it is possible to have the x-ray done. X-ray pictures are only of use in old cases, for recent ones the loss of time is too great. Use the magnet in a proper manner with a negative result in a recent injury, and even if later the foreign body is located with an x-ray picture, what more can be done? A negative x-ray picture after an unsuccessful magnet operation gives us double assurance that a foreign body is not present. "Sightless, quiet eyes that appear perfectly normal are preferable to glass eyes. After enucleation the use of an artificial eye often militates against the chances of obtaining employment and lessens the earning capacity. Magnus and Würdemann estimate the loss of an eye in mechanics at 27 to 30 per cent. during the first year after the accident and 18 and 20 per cent. during the subsequent period. Sightless eyes are often not recognized."

Some operators object to the giant magnet when the metal is a long piece lying crosswise in the vitreous for fear of injuring the eye to a greater extent; this fear is groundless, as the foreign body will turn and approach the magnet lengthwise.

"Magnet operations may be divided into two great classes; first, for eyes that positively contain a foreign body and second, those in which we have every assurance of the presence of a foreign body, but the magnet gives us a negative result. The negative result of the magnet is not positive proof that there is an absence of metal in the eye, but I have so many cases of this kind that I am willing to affirm that there is no metal in the eye when I cannot find it with the giant magnet and have a negative x-ray picture."

The objection of some operators to the strength of the giant magnet is easily overcome by the use of a properly constructed rheostat.

The author uses in most instances a 4 per cent. solution

of cocain, and by this local anesthetic obtains the assistance and co-operation of the patient.

“AUTHOR’S STATISTICS.

Total number of cases one hundred and fifty.	
Symptoms of metal in the eye, but negative result with magnet.....	49 Cases
Metal removed.....	97 “
Metal found in eyeball after enucleation—	
“magnet negative”.....	4 “

RESULTS.

Good vision.....	96 Cases
Sightless eyes — “ External appearance good”.....	34 “
Enucleations	20 “

The magnet failed to extract the metal in only four cases in which the metal was found after enucleating, but I believe that it was not so much the fault of the magnet in not extracting the metal from these cases as it was my inexperience in handling the instrument. To do the magnet justice very large pieces of metal are usually fatal to the eye, no matter how they are extracted.

The Cosmetic Value of Paraffin Injections After Enucleation of the Eyeball.

RAMSAY, A., Maitland, Glasgow. (*The Lancet*, Jan. 31, 1903.) The writer describes the method of procedure in using paraffin for forming a stump on which to fit an artificial eye, and gives his experience in 22 cases of this sort, having been well satisfied with the cosmetic result and with the free movement of the prothesis. He describes the operation as follows:

“The patient having been placed fully under the influence of chloroform, the eyelids are separated and kept apart by a spring speculum. The conjunctiva is divided as close as possible to the corneal margin, each rectus muscle is caught up on a strabismus hook and sutured to the overlying conjunctiva with a strand of catgut, the tendons of the recti muscles are cut at their insertion into the sclerotic, and thereafter the operation for the removal of the eyeball is completed in the ordinary manner. If

adrenalin chloride solution be freely used the amount of bleeding is very slight and the hemorrhage is easily stopped by douching the socket with hot sterilized water. The capsule of Tenon is packed with gauze till a strong black silk purse suture has been passed round the conjunctival margin, and then, the packing being removed, the melted paraffin is injected with a carefully sterilized glass syringe, the capsule being opened to its utmost capacity by holding the recti muscles on the stretch by means of the four catgut sutures, and filled to overflowing. The purse suture is then tightened (care being taken to hold the patient's head steady and to relax the tension on the recti muscles) and is securely fixed by a double knot, and the catgut sutures are tied, the superior rectus muscles being approximated to the inferior and the internal to the external. The paraffin is thus induced to mould itself in the socket and to form a stump to which the divided muscles readily attach themselves. The excess is wiped away and, after the conjunctival surface has been carefully bathed with boric solution, a compress and bandage are applied.

This operation is followed by very little inflammatory reaction and as a rule causes the patient hardly any more discomfort than simple enucleation does. The purse suture is kept in place for a fortnight and when it is removed at the end of that time there will be found over the freely movable paraffin stump a clean non-discharging surface of conjunctiva. A week later an artificial eye can be adjusted, the ordinary shell proving as a rule quite satisfactory, though sometime better results can be obtained from the use of the form recommended by Snellen. Care needs to be taken that this is not too large, otherwise the paraffin stump will move behind the prothesis. To insure success two points require special attention: First, the operation must be carried out with every precaution against sepsis and so it must not be attempted in cases where the eyeball is in a state of active suppuration, and, secondly, the sutures must hold the conjunctiva in accurate position over the paraffin. It is on the purse sutures that most reliance requires to be placed, and it is therefore very important to see when this is introduced that an equal grip is taken of the conjunctiva all around the free

edge and also that too wide an interval is not left between the stitches; but the catgut strands to which the muscles are attached afford great additional security. In one of my recent cases in which the suture holding the internal rectus muscles broke, a little opening made its appearance on the seventh day after the operation opposite the attachment of that muscle and the aperture grew gradually larger and larger until the paraffin escaped.

In my series of 22 cases there has been four failures. Thrice the paraffin has come out through insufficiency of the stitching, but in two of these the conjunctiva was simply drawn together by the catgut holding the muscles without any continuous suture. The purse suture was introduced in my fourth case and since then the only occasion on which the stitches have given way was that referred to above where the suture securing the internal rectus muscle broke. On one occasion after enucleation of a suppurating eyeball, pus appeared in the socket and set up so much inflammatory reaction that the stitches were removed and the moulded paraffin was allowed to escape. The paraffin employed is a sterilized preparation melting at 40° C., specially prepared by Rogers of Oxford street, London. It seems simply to lie in the tissues and gives rise to no irritation, but whether it will at length become absorbed or not time alone can show. Up to the present time none of the cases have given any sign of either shrinkage of the stump or impairment of its mobility.

Plastic Artificial Vitreous in Mules' Operation.

OATMAN, Brooklyn, N. Y. (*Medical Record*, March 7. 1903.) The writer discusses briefly the various efforts which have been made to mitigate the effects of enucleation. Discussing the Mules' operation he says: "When from any cause, a fistulous opening has once formed over an artificial vitreous, it resists all attempts at repair until the foreign body has been expelled. Under these circumstances it has always appeared to me that if a portion of the ball could be removed and the tension of the scleral walls relieved, we might hope for closure of the wound over the remainder. The following plan for using some material for the artificial vitreous that can, if necessary,

be removed piecemeal, has not, so far as I am aware, been previously employed."

He describes the procedure in a case in which he performed Mules' operation in the usual manner except "that instead of glass, a ball of paraffin was employed to fill the vitreous cavity." The paraffin employed had a melting point of 120° F. The wound apparently closed satisfactorily; but it was soon discovered that a small fistula existed through which the plastic paraffin was slowly oozing. With a Daviel spoon, warmed in hot water, a considerable quantity of the paraffin was easily extracted through the opening, the edges of which were then freshened and sutured. No success attended this procedure, the fistula remained patent and the paraffin continued to escape. Two subsequent attempts to close the hole were followed by failure, and it was decided that paraffin was unsuitable material for this purpose. No change for the better occurred until the paraffin had been discharged down to the level of the fistula, which, as the sclera had been stitched transversely, was about the center of the ball. When this point had been reached and about one-half of the paraffin had leaked away, the opening closed spontaneously and has remained closed since, a period of ten months. The remaining paraffin forms an excellent cushion for a shell, and the stump has good motility.

"In preparing the ball the paraffin was first brought to the boiling point and then cooled very quickly, as in histological work, to prevent crystallization and the formation of bubbles. A ball was then roughly shaped with a knife. This was brought to the required size by placing it on a long needle and rotating it in the flame of an alcohol lamp, the action of the flame being controlled by occasionally dipping the ball into a cold bichloride solution."

Mention is made of two other cases in which paraffin balls were employed with good results.

"The principle involved in this modification of Mules' operation requires a more extended trial before its value can be estimated. The following immature conclusions may, however, be drawn from these three cases: When fistula follows the Mules' operation it will close spontaneously if a sufficient quantity of the artificial vitreous can be removed. That which remains will form a good sup-

port for an artificial eye. Paraffin used for this purpose is prone to produce fistula by softening and getting between the lips of the wound, or into the track of a suture. These accidents are to be avoided by using paraffin or some modification thereof, that will not soften at body temperature; also by so suturing the scleral wound that no aperture remain through which paraffin can exude. A plastic material like paraffin will adapt itself to any inequalities on the surface of the glass shell, and ulceration from pressure is not apt to occur. Paraffin beads are easily prepared, and may be used in special cases in which glass beads of the required shape or size are not obtainable."

The Use of the X-Ray in Ophthalmic Surgery.

MAYOU, M. S., London. (*The Lancet*, Feb. 28, 1903.) The writer discusses the uses of the x-rays in (1) the localization of metallic foreign bodies in the globe, (2) the treatment of rodent ulcer, and (3) the treatment of trachoma.

"In the x-rays we have a method of setting up a leucocytosis with the absolute minimum of destruction to epithelial and other tissues; and further we have a means of producing inflammation from a very slight leucocytosis to an actual gangrene of the part which with due care and experience we have under almost perfect control. Not knowing the organism which causes trachoma we cannot say whether the irritants which are used in its treatment, or the x-rays, have any effect on it. But we have in the x-rays a method of producing leucocytosis in any degree of severity from that following a mild application of perchloride of mercury up to that induced by jequirity; and, further, this leucocytosis is much more prolonged than that in any method previously adopted and the destruction is not nearly so great. Although granules disappear very rapidly under the x-rays, operative methods, which have the additional advantage of removing the diseased tissue, must be preferable to some extent except that the patient has to undergo an operation, but such operations can be followed by the x-rays to complete the work in preference to one of the other irritants now in use. Operation, however, should never follow x-ray treatment without a considerable interval.

At the beginning of 1902 I showed before the Ophthalmological Society a case of trachoma which had been treated by the x-rays and which, so far as I know, was the first of its kind. The method adopted was to recover the whole face, with the exception of the affected eye, with a metal mask. (Since then I have discarded the mask altogether, and now I never expose the patient sufficiently to get any reaction at all in the skin.) The upper lid was then everted and the lower lid was pushed up so as to cover as much of the cornea as possible, but in bad cases of pannus the cornea is exposed. I have never had any trouble with the globe following x-ray treatment, and in a case of rodent ulcer of the lid in which the treatment was used for six months and which I showed at the same society last June there were no signs of retinal, corneal, or other trouble, with the exception of conjunctivitis, and the patient's vision remained the same ($\frac{6}{9}$) throughout the treatment. The patient is seated about nine inches from the anode with a moderately soft tube and a current of six ampères. Two minutes' exposure is given for from four to six successive days, depending on the case. If there be much injection or the case be an acute one, four are generally sufficient. A week's rest is then given and if no reaction is set up the patient is exposed twice a week until there is a slight increase in the photophobia, which shows that he is beginning to react. About this time the granules begin to disappear from the lids. Exposures once, twice, or three times a week are carried out until they disappear entirely. When once the granules have disappeared all treatment must be stopped, as it requires some weeks for the infiltration to set up by the x-rays to settle down and it is difficult to tell whether the disease is absolutely eradicated, as the lids remain injected for some time after treatment has ceased. The final result to the lid is most satisfactory. Instead of the white puckered conjunctiva gained by other methods a supple, non-contracted, non-scarred conjunctiva, with no obliteration of the fornices unless they are already gone before treatment, is produced, similar to the soft, supple scar in the skin following this form of treatment in rodent ulcer, as compared with the dense cicatrix of excision.

As regards the effect on pannus, it often clears with

great rapidity, especially if recent, and it is the common thing for patients to say that they see more clearly from almost the first exposure. But even the dense corneal opacity will often clear considerably and in one case of extensive destruction and cicatrization of the cornea, in which at the commencement of treatment the patient could only see shadows, in two months she could count fingers three feet away. Another peculiar point is the amount of exposure required by different patients. Sometimes the granules begin to disappear from almost the first exposure; others require eight or ten exposures before showing signs of reaction.

With regard to the cases suitable for treatment, the most satisfactory are the chronic cases, and of course the earlier they seek treatment the more rapid and satisfactory is the result. These patients will stand more frequent exposure than any others; acute diffuse infiltrations with thickening of the lids and much photophobia require more careful exposures extending over a much longer period. Old-standing cases in which the lid trouble has almost disappeared, but in which there is much opacity of the cornea, will often improve under exposure of long intervals after the first reaction, which should be mild. The chief advantages of this treatment are: (1) there is considerably less deformity in the lid after treatment; (2) it is practically painless treatment; and (3) pannus clears more thoroughly. It is eminently suitable for hospital patients who cannot attend daily for the other methods of treatment to be carried out. In the first cases the patients were troubled with some falling out of the lashes and conjunctivitis. In no other case out of some 15 has there been similar trouble."

On the Curative Treatment of Trachoma by X-Ray True Exposure and by High Frequency Current.

STEPHENSON, SYDNEY, AND WALSH, DAVID, Edinburgh. (*Med. Press and Circular*, Feb. 18, 1903; also *The Lancet*, Jan. 24, 1903.) The writer comments upon the obstinacy of trachoma, especially when complicated with corneal changes, to all form of treatment, and the superiority of surgical measures in dealing with this affection. They allude to the only recorded instance of the use of the

x-ray tube in trachoma—a single case reported by Mayo.

“The focus-tube treatment has been applied by us with varying results in several forms of eye disease. In the present communication, however, it is proposed to deal with trachoma alone. Four cases have been thus treated, and in all of them a marked improvement was at once noted. The four patients were male children, whose ages ranged from two to twelve years. In each of them both eyes were affected with typical hypertrophic and severe trachoma, the cornea being involved in three cases. Under ordinary treatment one might have been expected to cure these cases, say, in the course of eighteen months or two years.

Little need be said about the actual details of treatment. A twelve-inch Cox's coil was used with the “Record” focus tube of the same maker. For the first few exposures the apparatus was run with a strong battery and an ordinary spring break. Afterward a Mackenzie-Davidson mercury break (of the improved form made by Cox) was substituted, together with current run direct from the main. The focus-tube was “hard,” with an average resistance equal to a seven or eight inch spark gap on the coil. The anticathode of the focus-tube was placed at an average distance of eight inches from the eye, and the average exposure was from ten to fifteen minutes. One child proved more susceptible to the action of the focus-tube than the others. After the first few exposures a mask of lead foil was used to protect the face, and so made that one or both eyes could be exposed to the tube. An average current strength of five ampères and twenty to twenty-five volts was used. In order to control results, one eye only was exposed in three out of the four cases, and in one of the three the lids were held everted during the exposure. In the fourth (trachoma and pannus) both eyes were exposed simultaneously to the focus-tube, and the lids of the right eye were everted. The cases were chosen from children in whom the disease was well marked and bilateral, and nearly as possible of equal severity on the two sides.

The general results may be thus stated: Of the four cases of trachoma treated with the focus tube the eyes appeared to be cured in two, while such considerable im-

provements took place in the other cases as to promise an equally favorable result with a continuance of the treatment. On several occasions slight superficial dermatitis of the lids was noted, and in one case it amounted to a blister. The face was also similarly affected one or twice. A moderate dermatitis also occurred on the fingers and back of hand of the nurse who held the lids everted during one of the short distance exposures (four inches). A shield and a mask of lead prevented any further mischief, so far as hands and face were concerned.

The rapidity of the curative action is noteworthy. Every case showed an improvement from the first exposure. The immediate effect of the focus-tube was to render the granular bodies redder and more prominent. That appearance was followed by a stage during which rapid absorption of the granulations presumably took place. Out of the five eyes treated in the four patients two appear to be cured at the time of waiting, while the rest of the treated eyes are well on the road to cure. On the other hand, the three eyes untreated by the focus-tube remain just as they were when the patients were first put under this special treatment, that is to say, the conjunctiva shows at the present moment severe typical trachoma.

During the focus-tube exposures the eyes not thus exposed have been treated daily with an ordinary antiseptic wash. The method of control adopted establishes the fact that the curative agency has been exposure to the focus-tube, as that has been the only altered condition preceding cure or marked improvement in the treated eyes. The eversion or otherwise of the lids appears not to make the least difference in results. This is fortunate, as it is no light task for the operator or his assistant to keep a child's lids everted for ten minutes or a quarter of an hour at a time. The apparent cure of the two eyes resulted from seventeen exposures in one case, and from sixteen in another. It may safely be claimed that these results obtainable by a few weeks' treatment with the focus-tube opens up a new era for the ophthalmic surgeon, not only as regards trachoma, but other diseases of the eye as well.

The clearing up of the corneal opacities and the partial disappearance of the pannus in one case, suggest an ex-

tended and important application of the Röntgen methods in ophthalmic work.

With regard to the trachoma apparently cured by the high frequency current, the results were obtained after twenty-two applications. A twelve-inch spark coil (Cox) was run from the main connected with a D'Arsenval high frequency apparatus. One end of the solenoid was earthed, while the other was connected with a volcanite electrode, with which the closed right eyelids were gently massaged. A small brush discharge of about half an inch was obtainable from the electrode, and this probably would have acted on the trachoma equally well without actual contact of the electrode with the lids. It was noted at times the orbicularis and the *currugator supercilii* muscles were thrown into action. So far as we can ascertain this is the first application of the high frequency current to the eye. Its results has not been less striking than definite. By this means, as with the focus-tube, more improvement has been effected in trachomatous lids than could have been reasonably expected under months or even years of ordinary escharotics.

Treatment both by the focus-tube and by high frequency current has the great merit of painlessness. Under both methods it was a common occurrence for the children to fall asleep. This state of things offers a strong contrast to the discomfort and pain produced by the application of solid sulphate of copper and other escharotics—liquid or solid—to the conjunctiva, suffering that is only partially checked by cocain. The rapidity of cure is another important fact, as it not only prevents a needless expenditure of time and money, but it also reduces the chances of onset of serious complications that beset the path of trachoma, especially as regards the cornea. As all ophthalmic surgeons know, the longer the course of the disease, the greater the risk of complications. Almost, if not quite absolute safety may be claimed for both forms of treatment if applied by skilled hands. At the same time it can be hardly too strongly insisted upon that the application of the focus-tube to the eye by unskilled or careless persons might play havoc with a delicate organ.

In addition to the slight surface "burns" above noted, the eyelashes become thinner in some of the eyes treated

by the focus-tube. In one case after ten exposures with everted lids, a small infiltration appeared in the lower fourth of the cornea, looking like an ordinary phlyctenular (eczematous) deposit. This was followed in the course of the next week by several similar but smaller deposits in the lower outer quadrant of the cornea, and these later developed into small ulcers. It is an open question whether these phenomena were or were not connected with the special treatment."

Expression of the Lid Margin as a Therapeutic in Blepharitis and its Complications.

FRIEDENBERG, PERCY, New York. (*N. Y. Med. Journal*, March 7, 1903.) The writer calls attention to the hair follicles and glands of the margins of diseased and inflamed lids as a source of infection of an abraded cornea, or even one whose epithelium is, to all appearances intact. Retention of pus and the growth of bacteria in this locality account for some cases of stubborn and recurrent blepharitis, and for affections of neighboring tissues, notably of the cornea, exposed as it is to actual inoculation by winking or in rubbing the eyes.

Expression of the lid margin has been used before cataract operation, in apparently healthy lids as a measure of asepsis, to complete mechanical cleansing. Its use as a therapeutic procedure is not mentioned in text books and appears to be little known. Two cases of obstinate blepharitis, one with recurrent superficial keratitis, are cited; both were cured by this procedure. The writer refers to other cases in which, however, expression was not the only treatment used. It is not recommended to take the place of the usual and generally necessary methods (correction of ametropia and muscular imbalance, regulation of diet, local applications, etc.,) but as a valuable and generally neglected aid.

A Case of Primary Epibulbar Sarcoma with Secondary Growths in Limbus and Sclera and Invasion of the Chorioid, Ciliary Body and Iris. (Illustrated.)

VERHOEFF, FREDERICK, AND LORING, ROBERT G. Boston. (*Archiv. Ophth.*, March, 1903.) The authors report a case which, "from the clinical picture alone was taken to be

one of primary melanotic sarcoma of the limbus, the sclera-nodules being regarded either as staphylomata or as secondary growths. An involvement of the interior of the eye was suspected on account of the complete loss of vision. Macroscopic examination of the enucleated eye bore out this clinical view of the case, but the microscopic examination, while confirming the extraocular origin of the growth, showed a different relationship between the epibular nodules. The solid structure of the upper nodule was in such marked contrast to the structure displayed by the rest of the growth, the latter showing an infiltrating character throughout, that there could be no doubt that this upper nodule, not the tumor of the limbus, was the ordinary growth. This was in confirmation of the patient's statement, obtained later, that the inner nodule was the first to make its appearance. That the intraocular portion of the tumor did not represent the starting point for the growth is clear from two facts: first, that it was not continuous with the upper nodule, the one first noticed by the patient, but with the tumor of the limbus; and second, that it had the same infiltrating character as the tumor of the limbus, consisting of the edematous tissue infiltrated with tumor cells. Macroscopically too it had the flattened-out appearance so characteristic of the secondary growths within the eye. The sequence of events therefore, was evidently as follows: They developed in the episcleral tissue just above the limbus, a solid spindle-cell sarcoma of the usual type, which after a time took on an exuberant growth toward the limbus. The tissue of the latter became more and more edematous, and its dilated spaces became lined by, and in some places filled with, tumor cells. The infiltration then continued at the base of the tumor of the limbus thus formed, and extended into the sclera, finally penetrating the latter and invading the chorioid, ciliary body, and iris. While in all probability metastases occurred in the internal organs, in the absence of a general autopsy this cannot be regarded as perfectly certain. It is interesting that the intraocular portion of the growth, except for its pigmentation, histologically presented an appearance almost identical with that of a metastatic carcinoma recently described by one of the writers. It is also interesting that the growth did not

penetrate the globe directly at the limbus, but at a short distance behind it, thus substantiating the visual view that the limbus is peculiarly resistant to invasion by malignant growths." Statistics show epibulbar sarcomata to be among the rarest of ocular tumors and of the 80 cases found referred to in literature details were accessible in 73 instances and only four are reported that penetrated the globe. They seem to penetrate the eye by direct continuity.

"It was early recognized that epibulbar sarcomata arise in the conjunctiva and in the great majority of cases at, or very near the limbus, and Panas, in his recent article, points out that the majority of all cases occur on exposed portions of the conjunctiva, i. e., in the palpebral opening. They have been variously observed as black, brown, pink or reddish tumors, sometimes forming smooth rounded elevations, and sometimes irregular nodular masses, often friable, bleeding freely; rather firmly attached to the limbus but movable with the conjunctiva on the sclera. The base of the tumor, even when the latter had reached large proportions, is almost always quite small and Bloch reports one case with a pedicle $1\frac{1}{2}$ cm. long attached at the limbus. On the other hand, the tumor may exceptionally take the form of a diffuse flat-swelling on the globe, and cover the entire cornea, and one case is reported that was connected with the cornea alone. As a rule, the tumor is readily separated from the cornea proper, and it is generally agreed that the corneal stroma is seldom invaded. It is true that there is occasionally a slight loss of the superficial layers of the cornea, and Sgrosso reports a case where the entire cornea with the exception of the membrane of Descemet was replaced by sarcoma tissue, but here the entire anterior segment of the eye, together with the orbital and palpebral conjunctiva, was involved, and the cornea may have atrophied, possibly from pressure. In the case reported by the Wadsworth and Verhoeff, the cornea was indeed infiltrated the one-third of its depth by tumor cells, but in most cases the cornea shows a remarkable resistance, as does also the sclera in a nearly equal degree."

"Without operative interference these tumors tend to increase steadily without pain, though with variable rapidity." Advanced age is most frequently attacked, the

average in the 73 cases referred to being 51 years. Three cases however are reported respectively eight, eleven and fourteen years of age. As regards pigmentation, twelve were leucosarcomata; twenty-two contained small amounts of pigment; and thirty-nine were distinctly melanotic, but some melanotic types recurred as leucosarcoma and *vice versa*. Traumatism, pre-existing pterygium or irritation are cited as etiological factors. As to malignancy, opinion differs as to degree, but all agree that they tend to recur persistently—of the 73 cases reported “19 were treated by primary enucleation and 53 by primary abscission (in many cases followed by enucleation) and one case was first seen at autopsy.” The results were as follows:

Total primary abscissions.....	53
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No recurrence:

After six months' observation...	1	
After one years' “ ...	4	
After two years' “ ...	1	
After several years' “ ...	2	8

Recurrence occurred:

Within one year.....	10
Within two years.....	3
Within several years.....	4
Exact time not stated.....	19 36

Not followed after operation.....	9
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53

The authors however believe that “epibulbar sarcomata must be considered highly malignant, judging by their tendency to recur and produce general metastases. That the immediate results are not always serious and suggest a relative benignancy, may be explained by the facts that these tumors are at first isolated on the conjunctiva resting on sclera or cornea, both highly resistant to invasion; and that they are observed very early, for an epibulbar tumor is noticed and treated much sooner than a small nodule elsewhere. Histologically they do not differ from other sarcomata, and the writers believe them to be essentially no less malignant. That a few may be cured by abscission alone, can be explained by their small size and isolated

situation at the time of operation. The cases, however, are few, and it will be observed that in the forty-four cases of abscission that were followed (where operation was performed in most cases before the tumor had exceeded the size of a pea) recurrences were known to have occurred in thirty-six, i. e., in 81.8 per cent. (and in all probability in many of the others which were not observed), and in the total number of cases, omitting only the nine abscission and the ten enucleation cases not followed after operation (fifty-four), metastases occurred either before or after operation in twelve (22 per cent.) 'six of which were general (11 per cent.). That the results for enucleation would be more favorable is natural on account of the more radical nature of the operation; and that there were some general metastases even after enucleation certainly strengthens the argument in favor of the malignant nature of epibulbar sarcomata.

The trend of opinion among most observers is in favor of simple removal at first with more and more radical treatment as recurrence occurs. Sillex thinks the choice of operation should depend upon the intelligence of the patient and his ability to report for observation; and he favors enucleation where there is any chance that the patient may neglect medical treatment or in any case if vision is lost (and it may be noted that it is almost always impaired from irregular astigmatism). While recognizing the malignancy of these tumors on general surgical and pathological principles, Sillex deplors the too ready enucleation of eyes regardless of sight and the extent of the neoplasm. Lagrange is of the same opinion, remarking that although these tumors are of the same structure as the most malignant melanotic tumors, they are remarkable for their benign behavior, and he thinks a radical operation should only be done when they threaten to spread over the entire globe.

In opposition to the above, the writers believe that simple abscissions are decidedly dangerous, and that in view of the safety of the patient enucleation is always to be preferred. A large number of all abscission cases finally come to enucleation after a more or less protracted period of ineffectual treatment, and thus at a most favorable time.

CONCLUSIONS.

(1) Epibulbar sarcoma differs from general sarcoma in malignancy only in so far as it is isolated on the highly resistant cornea and sclera and comes to operation relatively small.

(2) While highly malignant it seldom penetrates the interior of the eye.

(3) After abscission recurrence, sooner or later, almost invariably occurs and general metastases are not infrequent.

(4) A microscopic examination having made the diagnosis certain, immediate enucleation should be advised in all cases, but the final choice of operation must lie with the patient, to whom the highly unfavorable prognosis has been made clear."

Abstracted report of the cases referred to are appended:

Glioma Retina with Report of Five Cases.

HOLMES, CHRISTIAN, Cincinnati. (*Jour. Amer. Med. Assn.*, Mar. 28, 1903.) "Glioma is a disease limited to childhood, and we may consider it the only true neoplasm developing in the retina. Virchow believed the cells of this class of tumors to be derived from the supporting fibres of the retina (the glia), hence gave it the name of glioma retinae.

"Wintersteiner has tabulated 500 cases from all sources, 31 of these being his own, which had been very thoroughly studied microscopically. The same author has tabulated the following cases, in which the origin of the gliomatous growth could positively be traced to one or more of the retinal layers with the following results:

(a) Origin in layer of optic nerve fibres.....	5 cases
Origin in inner nuclear layer	19 cases
Origin in any of the inner layers of retina	12 cases
Total.....	36 cases
(b) Origin in outer nuclear layer	9 cases
Origin in outer layers of retina.....	3 cases
Total.....	12 cases

"From this we observe that the origin is three times

more frequent in the inner than in the outer layers. We must remember that the origin is not limited to one layer of the retina, but may spring from several layers in the same case. It has been observed that gliomata have their origin four times more frequently from the posterior than from the anterior half of the globe. The same author accepts Cohnheim's theory that tumors have their origin in the masses of embryonic cells which are at times left over in the building of the normal structure, these cells remaining dormant in their embryonic state until at some later period they may take on an active and perverted growth. Prof. Schöbl, who has observed a very large number of this class of tumors, concludes that glioma may start from the supporting fibers of any of the layers of the retina, but mostly from the inner nuclear layer. In this layer Da Gama Pinto found that the nuclei were mostly in process of division with karyokinetic figures."

It is a well established fact that glioma is a form of tumor independant of and different from sarcoma.

"The most frequent mixed tumor of this kind is gliosarcoma (Virchow). When spreading into the chorioid and sclera and beyond the eye, gliomata may sometimes change their character in that their cells grow larger, up to 15 microns, while their nuclei remain comparatively small—6 to 10 microns; that is, the protoplasm is increased, or, in other words, the cells assume the character of small round-celled sarcoma. Berthold was the first who asserted that gliomata may assume a sarcomatous character, after having spread into the chorioid, and that this membrane, irritated by the entering of the glioma cells, furnishes the sarcomatous elements. In a reverse way it may occur that sarcomata of the chorioid takes on a gliomatous character. This, perhaps, explains Von Craefe's two observations of gliomas in adults.

"Prof. Schöbl's remarkable case of glio-fibro-sarcomyo-angioma confirms the statement that the character of the tumor often depends on whether or not it has invaded other tissues."

Glioma spreads in the retinal structure: 1, by enlargement of a single or the confluences of several smaller nodules, and 2, by metastasis within the retina.

The growth of the primary nodules takes place through

division and multiplication of the cells next to the blood-vessels, whereby the older cells are constantly crowded farther back toward the periphery and become necrotic for want of nutrition.

The growth spreads in three ways: 1, through the inter-lamellar spaces; 2, through the lymph channels, and 3, through the blood-vessels.

It is characteristic of the development of glioma that the growth not alone displaces other structures by pressure but replaces them by neoplastic tissue. With the destruction and transformation of the retina by the rapidly developing gliomatous tissue come retinal detachment and an extension of the process to other structures, the chorioid being generally and naturally to be the first to be involved. Beyond the retina and the chorioid the extension of the neuro-epithelioma takes place most readily along the optic nerve, the cancer tissue replacing the nerve bundles and finally extending to and involving the chiasm and surrounding structures. Secondary tumors have been found in nearly all of the organs and even the bony structures are frequently involved.

In the second and third stages the growth replaces the orbital tissue, extending to and destroying the periosteum and bone by erosion.

The diagnosis between gliomata and other tumors is easily made, but the differentiation of the pseudo-glioma is fraught with many difficulties, but only when the disease is well advanced. We must differentiate from: 1, detachment or cysts of the retina; 2, tumors of the chorioid and ciliary region; 3, masses of inflammatory exudate in the vitreous (pseudo-glioma), and 4, the combination of true glioma with any of the above.

The greatest difficulty in making a correct diagnosis occurs when the cornea, aqueous or lens have undergone such changes as to prevent inspection of the interior of the globe, cataract being the most frequent condition encountered. As a rule, we may state that inflammatory exudates into the vitreous give a yellowish reflex, with a metallic luster and smooth surface, while the color of glioma might be a light yellow, reddish or greenish-yellow and the growth is nodular.

The diagnosis may be complicated further by the for-

mation of a post-inflammatory membrane of exudate upon the hyaloid membrane directly behind the lens, by chronic inflammation and fibrinous exudate into the vitreous, or by acute suppurative hyalitis. From detachment of the retina it should be readily differentiated by a careful ophthalmoscopic examination, and from tumors of the chorioid by the fact that they are nearly all pigmented. Leucosarcoma of the chorioid is rare and its growth is dissimilar to that of gliomata. It develops as a solitary half-round mass over which the retina may be atrophied, but does not form reduplications and thickened masses.

There is often great difficulty in making a differential diagnosis between the true and the pseudo-glioma.

It is of interest to remember that the second eye appears never to have been found to become involved by an extension of the disease along the optic nerve and through the chiasms from the first eye. Where both eyes are affected, the disease always develops independently in each eye.

The disease may extend backward along the optic nerve to the chiasm, involving adjacent structures and causing death, but it has not been known to travel from the chiasm peripherally along the nerve of the sound eye; blindness of the non-affected eye due to atrophy may, however, result because of the destruction of the nerve fibers in the chiasm.

The influence of heredity has not been demonstrated; as yet we know of no case in which an individual who had an eye removed in childhood for glioma, has transmitted the disease to his offspring. There are, however, many cases on record where several members of one family have been affected.

"The disease may be divided into three stages of development:

1. Period of intra-ocular growth, without increased tension or inflammatory symptoms.
2. Glaucomatous or inflammatory period, which ends with rupture of the globe.
3. The period of extra-ocular growth and metastasis.

In some cases there is temporary arrest and even retrograde change, such as phthisis bulbi after rupture or violent inflammatory reaction of the globe, the temporary

arrest being probably due to destruction of the vessels of nutrition with degeneration of the glioma cells as a result of the suppurative process.

Death may result from:

1. Involvement of the brain.
2. Cachexia.
3. Pressure of the growth on the medulla oblongata.
4. Suffocation from extension of growth into the pharynx and larynx.
5. Pyemia or septicemia, with metastatic abscess.

The duration of life when there is no surgical interference varies greatly, but from a few months to three years is the average. A few cases have been reported where the first period lasted five years from the time the disease was first discovered. The average duration of the second stage is from 2 to 21 months, while the third stage from the rupture of the cornea to the fatal termination is the shortest, varying from two weeks to one year, with an average of three months.

If there is no return in two years after enucleation the case may be regarded as cured so far as that side is concerned, but we must remember that the disease may occur in the other eye a considerable period after the first eye becomes affected, and we must then regard it as an independent attack in the same patient and not a recurrence of the primary growth.

The only treatment that can be considered as offering any chance of saving life is removal of the affected eye, with as much as possible of the optic nerve, at the earliest possible moment during the first stage. In operations undertaken during the second stage, before the rupture of the cornea, the chances of success are very slight, since the affection has often extended outside of the globe through the veins and lymph channels. But even then it is our duty to operate, and exenteration of the orbit should be added to the enucleation of the eye, if we hope to arrest the disease. In this stage I regard the use of pastes far superior to the use of cutting instruments, because the liability of opening up new avenues of infection is much greater in the latter method.

When the case has once entered the third stage the rule is that, no matter how thoroughly exenteration is per-

formed, there is always recurrence within a few weeks, and operation in this stage is only justifiable in order to afford temporary relief.

With the advent of serum-therapy it was hoped that this mode of treatment might be of service, and Nieden reported his observations upon this method at the meeting of the Ophthalmological Society at Heidelberg in 1896. The cancer serum was injected in a case of recurrent glioma. At first there appeared to be an arrest of the growth, but it soon broke forth with greater fury than before, and went on speedily to a fatal termination.

Shall we advise enucleation if both eyes are affected? Since cases of undoubted glioma—as proved by the microscope—have been cured after double enucleation, and as the disease springs from a separate and independent focus in each eye, we should answer this question in the affirmative, and urge the operation if the disease has not progressed beyond the first or second stage in either eye. For if life is saved, blindness to a child at this period is not a barrier to its acquiring an education and becoming a useful and independent citizen.”

A detailed report of 5 cases is appended and thoroughly discussed.

A Contribution to the Differential Diagnosis Between Glioma of the Retina and Pseudoglioma.

FEJER, JULIUS, Buda Pesth. (*Archiv. Opth.*, March, 1903.) One distinguishes four stages in the development of glioma or neuro-epithelioma of the retina. In regard to the differential diagnosis, only the first two stages need be taken into consideration, for, in fact, it is only in the first stage that the diagnosis may be difficult. When inflammatory signs with increased tension come on, the malignancy is assured.

In the first period—that is, during its intraocular growth—the symptom of the yellow reflex from the interior with complete amaurois is the chief characteristic, and gave rise to the old name “amaurotic cat’s eye.” The tint and the hue of the reflex depend upon the transparency of the refractive media, the size and location of the tumor, and various minor conditions. When the tumor pushes the retina forward before it, the color may be white or

blush-white. When the diagnosis rests upon the ophthalmoscopic examination only, an error is easily possible and only the further observation of the case will reveal its true nature.

The cases which give rise to error can be grouped according to Wintersteiner into two classes:

(1) Cryptoglioma, in which an existing tumor cannot be diagnosed on account of accompanying symptoms. Shöbl invented this name and described cases in detail.

(2) Pseudogliomas in which inflammatory changes exist in the eye and lead one to suspect glioma.

But more frequently other affections of the eye are mistaken for glioma. Among these are detachment of the retina and sarcoma and tuberculoma of the chorioid. Apart from the fact that these diseases are rare in childhood, detachment of the retina has characteristic differentiating symptoms, such as the bluish-gray color of the detached retina, the floating of the membrane, the regular branching of the vessels, and the diminished tension of the ball. The diagnosis of the two other diseases is not difficult.

As pseudoglioma proper, however, we designate that group of cases in which the yellow reflex appears and the eye becomes blind in consequence of chronic inflammation of the chorioid or ciliary body. The inflammatory product becomes organized in the vitreous and causes detachment of the retina. In such cases the history is of especial importance.

This disease in the child begins usually but not always with inflammation and pain. The eye is irritated and there is photophobia. The color of the reflex is a metallic yellow. The exudation contains no vessels, while tumor is rich in them. The surface of the exudation is smooth, that of the tumor is nodular. All this cannot be considered a definite rule since there are many exceptions. The most important point is that tension in cases of tumors is normal at first and later becomes increased, while in cases of exudation tension is diminished, particularly in the later stages when atrophy and retraction begins. Confusion and errors in the diagnosis of glioma cannot be avoided.

Concerning the Disappearance of the Lesion in Circinate Retinitis.

DE SCHWEINTZ, G. E., Philadelphia. (*Ophthalm. Record*, Feb., 1903.) Two cases are reported: The following explanations have been suggested to account for the lesions of circinate retinitis:

1. Fibrinous exudates in the deeper layers of the retina coagulate and form the plaques and masses which constitute the characteristic zone (Fuchs).

2. The foci represent areas of fatty degeneration which in turn have arisen from hemorrhages; in other words, the disease is not a special form of retinitis but is a fatty degeneration following hemorrhage retinitis (De Wecker).

3. The white spots consist of fat cells where formerly hemorrhages had been present (Amman).

4. The lesions depend upon a fibrinous exudate, in which fatty changes may take place in the later stages, in the external retinal layers, their location being limited to the so-called layer of Henle (Nuel).

5. The yellowish white areas are simply one of the manifestations of an old standing edema, thus marking out the periphery of the affected region, the size of the circle varying according to the amount of the previous affection (Marcus Gunn).

6. The characteristic degeneration depends upon vascular changes, especially upon changes in the group of vessels which supply the macular region; these vessels are obliterated and the parts supplied by them are destroyed (Goldzieher). In other words, this condition of degeneration of the tissue of the retina results from a disease of the smallest macular vessels, especially the arteries (Oeller).

It is possible that several of these explanations may be correct, one being operative in one case and a second in another, but I think, in spite of the assertions of De Wecker, Masselon and Amman, based as they are on clinical and pathological observations, that it is too much to assume that these white patches always depend upon pre-existing hemorrhages. As Oeller justly says, "it is not very intelligent how such large patches with a quite definite and characteristic grouping should develop from hemorrhages which perhaps are not always visible with

the ophthalmoscope, but are at any rate irregularly distributed. Although retinal hemorrhages do usually occur in retinitis circinata, yet the appearance of white dots after hemorrhages proves their etiological relation to one another just as little as their simultaneous occurrence would, even though the anatomical examination does show disintegrated red blood corpuscles inside fatty granular cells. The ring of spots, therefore, could hardly be a direct result of hemorrhages. The hemorrhages and spots, however, have most likely a common origin in the degeneration of the vessels."

It must be further admitted that not all of the eye-ground lesions which have been described and depicted as circinate retinitis are exactly alike. In other words, both typical and atypical varieties have been recorded. This fact may explain the different views which have been expressed in regard to the etiology of the affection and still further help to explain varied statements as to the ultimate outcome of the disease, i. e., whether the lesions are permanent, progressive or retrogressive. Taking all cases together three terminations seem possible:

(1) The disease is essentially chronic and the ophthalmoscopic appearances remain unchanged for years.

(2) True white degeneration of the retina is slowly but surely progressive (De Wecker). Indeed, to use the words of Joseph Schöbl, "in some cases the exudation does not disappear, and gradually the retina becomes enormously thickened. The macular spot and zone of white spots are changed into dirty, yellowish-white, protruding, connective tissue like masses." Vitreous opacities, posterior synechiae and retinal detachment may occur (Fuchs).

(3) The ring of white spots may partly disappear, as, for example, in my first case, or to speak more accurately, the zone of exudate breaks up and partly disintegrates; or the entire circinate exudate may disappear, as in my second case and also in one recorded by Hartridge; or finally, both the macular exudate and zone of white spots may be absorbed, as in a case recorded by Fuchs.

I am well aware that DeWecker would exclude from the category of true white degeneration of the retina, those cases in which a disappearance of the lesions have been described; but if they are admitted, as it seems to me they

should be, at least as varieties of the disease, even if they are not typical (and one of my cases does not seem to be far from typical, while another in which there was partial (later entire) disappearance of the circinate lesion was exactly typical), then we may say that the disease is not always progressive.

The evident conclusion of the matter is that given a case of so-called circinate retinitis, a fatal prognosis *quoad visum* should not immediately be given and all reasonable therapeutic measures should have fair trial.

As to the length of time required for the absorption and disappearance of the spots definite statements cannot be made. I have seen beginning disintegration of the ring in five months in one case, and its complete disappearance in a little more than a year in another. Four years elapsed before this desired result was obtained in one of Fuchs' patients. Doubtless in those cases in which the processes of absorption remove the white spots, the disease of the macular vessels which has caused the lesions to arise has not been sufficiently pronounced or persistent to bring about destruction of the areas which they supply; or it may be that Marcus Gunn's explanation fits these cases, i. e., that the zone of white is really a manifestation of long-standing edema. Suppose, as he suggests, that an inflammation of the macular region arise and from it an edema extends circularly for a certain distance until stopped by contact with the healthy retina. At this peripheral circular fold or puckering the changes would take place and assume the shape they have in circinate retinitis. Suppose again that the central inflammation should subside and with it the edema, then also would the white spots by which it was interpreted disappear. Be this as it may, these cases should be treated. I have some faith in the iodides, especially the iodide of sodium; mercuric bichloride seems useful. I would also try subconjunctival saline injections and perhaps pilocarpin diaphoresis.

Metastatic Carcinoma of the Chorioid, with Report of a Case and Review of the Literature.

OATMAN, E. L., Brooklyn, N. Y. (*The American Journal of the Medical Sciences*, March 1903.) The writer gives a brief account of the history of this affection, followed by

details of an example occurring in his own practice, with the results of anatomical and microscopical examination. He submits extracts from the 34 published cases which he has been able to collect, with remarks; 4 of these are open to doubt and are consequently not included in the list of cases, but are discussed in separate abstracts. A full and interesting commentary is followed by the following resumé:

“A review of the literature yields thirty cases which are considered genuine. The average age was 44 years. Twenty of the primary growths were situated in the breast, three in the lungs, two in the liver. There were twenty-two female and eleven male cases; this preponderance of three females to one male is not due to influence of sex but to the greater frequency of carcinoma of the breast among women.

Twenty right eyes and nineteen left eyes were affected; this disproves the prevailing theory that the left eye is most frequently invaded. Both eyes were involved in ten cases. While the deposit of a carcinomatous metastasis in the eye is an extremely rare event, when it occurs in one eye the other eye is also invaded in one-third of the cases. This bilateral peculiarity is ascribed to some unknown factor which ordinarily prevents the development of metastatic carcinoma in the chorioids, but in these particular cases it is for some reason in abeyance.

The deposit always occurs near the point where a short ciliary artery enters the globe. It appears in the corresponding region of the second eye when the latter is attacked. This indicates that the second eye is not invaded by way of the lymph channels of the optic nerve and chiasm.

The typical shape is a flat discoid thickening of the chorioid with a central elevation of two or three millimetres, gradually sloping off to a thin periphery. It spreads laterally, because it is an infiltration of the chorioidal lymph spaces with epithelial cells which naturally follow the path of least resistance. Sarcoma, on the contrary, is a growth of the fixed tissues.

The time from the first eye symptoms until vision is destroyed varies between two and eight weeks. The average is about five weeks. This rapid loss of vision is due

to an early and extensive detachment of the retina. As chorioidal carcinoma is always composed of granular epithelial cells, it is assumed that their perverted secretion actively assists in producing the amotiz retinae.

Tension is increased in one-third, and normal or diminished in two-thirds of the cases. A typical ophthalmoscopic picture is "flat oval deposit or tumor on the temporal side of the nerve, involving the macula, with the central elevation of + 3 D., its edges gradually fading off into the surrounding fundus. Its color is a dirty yellow, with scattered pigment spots."

The average duration of life after the first eye symptom, is six and one-half months.

In the differential diagnosis between carcinoma and sarcoma, the following points are noted:

Carcinoma of the Chorioid.

Always secondary.

Has always occurred posteriorly. Usually on the temporal side of the nerve.

A flat discoid tumor or thickening of the chorioid which spreads laterally.

Has not been described as appearing vascular.

Early detachment of the retina.

Destroys vision in a few weeks.

May be very painful with T. N. or T. —.

First symptoms may be a rapid increase in hypermetropia without marked ophthalmoscopic changes.

T. may be diminished.

Sarcoma of the Chorioid.

"Secondary sarcoma of the chorioid is unknown." (Fuchs.)

May occur at any point.

It is a rounded protuberance growing out into the vitreous.

May appear vascular.

Late detachment when centrally located. (Griffith.)

May exist for a long time with good vision.

Pain is due to T. +.

Too circumscribed to produce this phenomenon.

If confined to the chorioid T. is never diminished. (Marshall.)

Pre-existing carcinoma will, of course, suggest the character of the eye deposit; but in seven cases the good health of the patients was a subject of comment. In five carcinoma was first disclosed by the microscope.

Enucleation is not advisable unless the eye is very painful or glaucomatous, since the histories appear to indicate that an increased activity in the cancerous processes and a speedy death may be ascribed to operation.

When a metastasis has occurred in one eye its removal does not prevent a similar deposit in its fellow.

Review of Sixty-nine Cases of Rupture of Chorioid.

D'OENCH, F. E., New York. (*Archiv. Ophth.*, Jan., 1903.) This report was compiled from a total number of over 150,000 patients treated in the New York Ophthalmic and Aural Institute and covers a period of 33 years. The male sex suffered most, the rates being 53-16. Early life from 10-40 years was when the greatest number of accidents occurred. The seat of rupture was most frequently to the temporal side of the disc, between it and the macula, corresponding to the impact of the force. One eye was as frequently injured as the other. The most frequent complication was hemorrhage, iridodialysis, traumatic cataract, detachment of the retina, connective tissue formation in the retina and optic nerve atrophy. The rupture is almost invariably caused by a direct blow. The sight following the injury varied considerably, usually falling below 20/CC.

The varying state of the visual acuteness, especially the frequency of its great reduction, calls attention to the fact that it is not only the chorioid, which is affected by the injury, but also other part of the eye, and probably the retina most of all. We know that extensive changes may take place in the chorioid without affecting the acuteness of vision, but even slight changes in the retina are of much importance in this respect. The retina is made up of transparent elements and under ordinary conditions escape observation, and it is therefore probable that an injury sufficiently great to rupture the chorioid will produce changes in so delicate a structure, which, though invisible to the observer may cause most marked subjective disturbances. More severe blows may lead to subsequent changes which are readily apparent, such as atrophy of the nerve and marked pigmentation in the neighborhood of the rupture, which may partly be due to organization of the escaped blood, partly to proliferation of the chorioid or retinal pigment.

Primary Extradural Tumors of the Optic Nerve.

PARSONS, J. H., London. (*British Med. Journal*, Feb.

7, 1903; Report of Jan. meeting of Ophth. Soc., of the United Kingdom.) Clinical and pathological notes of a case were given and illustrated. There were 18 cases on record as compared with 102 primary intradural cases. The disease usually commenced before the age of 10 years, and the prominent symptom was exophthalmos, the protrusion being most marked in the axis of the orbit. The failure of vision was slow, slower than with intradural tumors, and was accompanied by optic neuritis of the "choked disc" variety, to be followed by post-neuritic atrophy. Later changes in the eye resulted from lagophthalmos. In no case was the globe invaded by the growth. Eight of the growths were undoubtedly endotheliomata, several having the characteristics of psammomata. The fibromatosis presented in most cases was a feature of importance. The growths were slow and of relatively low malignancy, giving rise to neither glandular dissemination nor to metastasis. Considering this fact and that the point of danger was at the apex of the orbit, Krönlein's operation, with retention of the globe, was indicated wherever possible.

Hyaline Bodies in the Optic Disc.

MORTON, A. STANFORD, and PARSON, J. HERBERT, London. (*The Lancet*, Feb. 14, 1903. Report of Jan. meeting of Ophth. Soc. of the United Kingdom.) This paper was based upon the study of recorded cases and notes of two additional examples. Out of the 42 cases recorded in the literature seven had retinitis pigmentosa, others were associated with injury, nervous disorders (from simple headache to chronic hydrocephalus and insanity), and chronic interstitial nephritis, but a large number of patients were normal, with normal vision. The condition usually commenced in early life and was extremely chronic. In nearly all cases both eyes were affected but often unequally. The prognosis was good. The pathological anatomy of the condition was discussed and various allied conditions were demonstrated. It was shown that *Drüsen* were not ordinary colloid bodies such as are found upon the chorioid, though these too might occur near the disc. Exudates similar to the hyaline nodules might become metamorphosed into true bone as was frequently seen in the chorioid in shrunken globes. The fate of exudates in

the disc and in other parts of the eye and its dependence upon environments were discussed.

Congenital Defect of Abduction Associated with Refraction of the Eyeball in Abduction.

EVANS, J. JAMESON, Birmingham. (*Ophthalmic Review*, Jan., 1903.) The writer gives detailed case-records and photographs of two patients presenting this interesting anomaly, and a synopsis of twenty-seven cases found in ophthalmic literature.

The most prominent features of the clinical picture are the following: "The condition is congenital, but in consequence of the small amount of discomfort and deformity, the child is not usually brought to the notice of the ophthalmic surgeon for many years. In most cases the defect is confined to one eye. In the primary position the axis of the affected eye may be parallel with that of its fellow, or it may converge or diverge slightly. The eye may also be appreciably enophthalmic, and in that case the palpebral fissure is narrowed. The distinctive features of the case become apparent when the patient attempts to move the eye laterally. Attempted conjugate movement toward the unaffected side is associated with imperfect rotation inward of the faulty eye, its retraction into the orbit and narrowing of the palpebral fissure, and sometimes an upward and downward rotation of the globe. On the contrary, when the patient attempts to turn the eyes towards the affected side the defective eye comes forward and widens the palpebral aperture to an extent equal to that of the normal side, but fails to move outward beyond the vertical mesial plane of the orbit. It appears to assume the position as a result of complete relaxation of the internal rectus rather than from any action of the external rectus, which is probably functionless.

When the patient is directed to make an effort of convergence the healthy eye rotates inward, but its fellow assumes the primary position, and at the same time comes forward and widens the palpebral aperture, in fact there is often a complete loss of convergencies, which is replaced by attempted conjugate movements to the affected side.

The pupils under such circumstances do not contract

when convergence is attempted. In a number of cases it has been found impossible to rotate the eyeball fully inward by traction with conjunctival forceps. In others a similar restriction has been found in rotation outward only.

The vision of the affected eye is seldom up to the normal standard, and not infrequently it is highly amblyopic. Diplopia may be absent altogether, or it may be present constantly, or only when certain movements are attempted. Headaches have also been noted, but as a rule the discomfort caused by the condition is insignificant. The anomaly seems to be more common in the female than in the male (14 out of 19 being in females), and much more common on the left than on the right side. Out of 27 cases which are on record, 20 were affected on the left side, 4 on the right side, and 3 were bilateral. It is seldom that more than one member of a family is affected, though there are distinct exceptions to the rule.

Referring to the existing doubt concerning the nature of the lesions which could give rise to this train of symptoms, the writer believes the defect is one which implicates the muscles themselves, for no purely nervous lesion could account for the retraction movement of the globe, even though it might explain the loss of abduction. He recites the theories advanced by Türk, as given by Wolf. According to the *faulty insertion* theory the retracting muscle, which is the internal rectus, is attached to the eyeball further back than normal. Hence the portion of muscle capable of unwinding itself from the globe is diminished and inward rotation is correspondingly replaced by a backward pull of the globe when the internal rectus contracts. In the *fixation theory*, it is assumed that the paralysed external rectus consists of an unyielding connective tissue strand in place of elastic muscle fibres. This fixes the eyeball on its outer side, and offers an obstacle to adduction so that the eye can yield to the traction of the internal rectus only by moving back into the orbit at the same time that it turns inward.

It is important to decide what is the actual structural defect in such case, since the proper appreciation of this will influence the success of treatment. Passive traction of the eyeball outward and inward with forceps will de-

monstrate any obstruction to external or internal rotation. Evans believes that most, if not all, of the cases might be explained by faulty insertion of the internal and external recti, including shortening and diminished elasticity of the internus and nasal development of the externus. The substitution of the external rectus by a fibrous band and its erratic insertion have been proven by exploration in several cases. A somewhat short band would restrict passive movements by traction inward. Shortening and diminished elasticity of the internal rectus is shown by the restriction of passive movement outward and by its fibrous appearance and inextensibility on exploration. Faulty development appears to be associated with faulty insertion. When the muscles are inserted normally, retraction may be caused by accessory bands inserted farther back.

"The presence of some muscular fibers in the external rectus in my first case suggest the possibility of a fibrous degeneration from want of use and the desirability of early operation and other treatment so as to give the muscles a chance of developing."

Enophthalmus in the primary position, ascribed by Wolff to the normal tonus of the internal rectus in conjunction with the shortened and unyielding externus, could be explained by both muscles being too short.

"It is difficult to explain why convergence should be absent in most cases. The upward or downward rotation of the globe during retraction seems to be satisfactorily accounted for by the resistance of the optic nerve acting in a plane below or above the horizontal."

"In the author's attempt at operative correction in one of his cases, the inextensible external rectus was lengthened by the usual method of tendon-suture; pronounced convergent strabismus ensued and the original symptom complex was in no way diminished. Tenotomy of the internal rectus was performed, allowing traction of the eye outward; a few weeks later adduction had been re-established, retraction and narrowing of the lid-aperture were in no way diminished; further attempts at rectifying the eye appeared undesirable.

In the treatment of these cases Evans considers it the surgeon's first duty to expose the tendons of both recti.

If their insertions are normal and no accessory bands are found, a fibrous external rectus is at fault and should be dealt with. In case of faulty fixation the tendon of the internal rectus must be lengthened as well as advanced. If there is interference with passive rotation inward the external rectus tendon should also be divided. Tenotomy of the internus might be tried where there is convergent strabismus in the primary position. This diminishes retraction, but, unfortunately limits adduction.

On Indirect Ruptures of the Iris.

LRVINSOHN, GEORGE, Berlin (*Archiv, Ophthalm.*, March, 1903), reports several cases and discusses the mechanism of the injuries, drawing the following conclusions:

“1. Changes in the pupillary margins of the iris altogether similar to those following occlusion of the eye may be found without any preceding injury and are probably of congenital origin.

2. The indirect injuries of the sphincter and of the iris in the general are in consequence.

(a) Of the flattening of the anterior chamber and the rupture of its elastic walls thus brought about;

(b) Of the pressure of the aqueous humor exerted equally in all directions.

3. According to their liability to rupture and their respective elasticity, various portions of the iris are injured with different frequency.

The series: (a) ciliary margin, (b) sphincter, and (c) the iris proper.

4. Whether the injury occurs on the same side as the trauma, or on the opposite side depends on whether the iris offers greater resistance to bursting or to bending. It would seem that the ruptures by bursting are more frequent.

5. The changes in the form of the pupil are the result of the injury to the iris and to the paralysis of the iris muscles. Usually there is a marked paralysis of the sphincter and a less marked transitory paralysis of the dilator. Ruptures of the sphincter in themselves cause only a low degree of mydriasis.”

The Treatment of Myopia.

LIEBREICH, R., Paris. (*Ophthalmic Review*, Feb., 1903.)

The results of the author's researches convince him that in determining the angle B, it is a mistake to take the whole orbit into account for measurements and statistical researches. "It is only the nasal side of the orbit which bears a constant relation to the center of rotation and the muscles of the eyeball. On the temporal side, on the contrary, this relation undergoes many variations. The nasal halves are, excepting some pathological cases, symmetrical, while the temporal halves are always asymmetrical. Even in skulls of very different sizes and shapes we find hardly any differences in the distance between the foramina optica, and the depth of these is also nearly constant when measured at the nasal side of the orbit, though it varies very much when measured on the temporal side. This enables one to determine the angle (B) formed by two lines going through the centres of rotation of the eyeball and the foramen opticum for different distances of the pupils.

I look upon the influence which variations of this angle have upon refraction and strabismus in the following way: If the angle B is larger than normal a greater effort of internal recti than usual becomes necessary in order to obtain convergency of the optic axis for a given distance of work, say for reading. The consequence, is a greater effort of accommodation than necessary. Convergence and accommodation moving in harmony, each eye is adapting itself for that distance for which convergence would be obtained in the case of normal B; therefore for a shorter distance than the one for which in this case of larger angle B convergence has been obtained. In consequence, a tendency is shown to approach the fixed object more closely than necessary, even if the refraction of the eye, the acuteness of vision, and the size of the object, are sufficient to admit of a greater distance.

For children in what I call the prodromal stage of myopia, characterized by approaching the object too closely in spite of normal refraction and normal sharpness of sight, I prescribe prisms as soon as they begin reading and writing. To determine the degree of the prisms, I choose the weakest which enables the child to keep the book at

the proper distance. In the same way I order the prisms without concave glasses when slight myopia is already manifest, and I confess that *I consider such a use of prisms as the only positive means of preventing the progress of myopia.* Of course I do not mean to say that any of the ordinary precautions should be neglected, such as proper lighting, posture, etc.

In all cases in which myopia is already developed to such a degree as to form an impediment to a right position, and to instruction in school rooms altogether, it is necessary to combine prisms with the weakest concave glasses which would be sufficient. Complete correction of myopia by concave glasses without prisms or decentration (the centers farther apart than the pupils) I consider dangerous in all cases with large angle B. With normal or smaller angle B it may be permitted. Such are probably all cases reported as proving the beneficial effects of constant use of concave glasses corresponding to the degree of myopia, a system recommended now by many ophthalmic surgeons."

The Symptomatology of Tabes: An Analysis of One Hundred and Forty Cases of Locomotor Ataxia.

COLLINS, JOSEPH, New York. (*Medical News*, March 14, 1903.) The following data are given of the pupillary phenomena, ocular palsies, and optic nerve atrophy occurring with this disease. .

The pupils were unequal in 25 per cent. and irregular in 6 per cent. of the cases. In 94 instances in which the size of the pupils was noted, it was pin-point in 36, small in 27, medium in 25, and dilated in 6; in 45 per cent. the pupils were small.

In 101 of the 140 patients, the pupils did not contract on exposure to light, in 15 the pupils were sluggish, making 80 per cent. in which there was loss of light reflex. It is very uncommon for the pupils to lose their capacity to contract in accommodation in tabes, but this peculiarity was present in 9 instances.

Diplopia was noted as having occurred 32 times, 22 per cent. in the majority of these instances it was comparatively an early symptom, and intermittent. There was a history or evidences of paralysis of one or more of the eye

muscles in 14 cases, 10 per cent.; the third nerve was affected most frequently. Some degree of ptosis was noted in 7 cases, 5 per cent. Nystagmus-like movements of the eye in forced positions, such as looking to the right and to the left, was noticed in 21 cases, 15 per cent. It is commonly supposed that ocular palsies are of frequent occurrence in tabes; but the writer found only 15 per cent., including the ptosis cases, and these figures agree with those of Bramwell and v. Sarbo.

Optic nerve atrophy was present in 19 cases, 14 per cent; other statistics vary from 7 to 30 per cent. The condition was not an early symptom, this experience being sharply in contrast with that of Starr. In no case did the superimposition of blindness seem to have any effect upon the course of the disease, this being at variance with the experience of Dejerine and others who report cases of tabes in which the development of optic atrophy was contemporaneous with amelioration of tabes, and who speak of "tabes arrested by optic atrophy."

Five Types of Eye-Movement in the Horizontal Meridian Plane of the Field of Regard.

DODGE, RAYMOND, Middletown, Conn. (*Amer. Jour. of Physiology*, Jan., 1903.) The writer refers to the fact that but a few types of eye-movement such as torsion and convergence, have found general recognition, having been isolated either on account of their relation to special problems or on anatomical grounds. The majority of eye-movements have no better classification than their direction. The well known and persistent untrustworthiness of introspective data regarding our eye-movements, and the difficulty of harnessing the eye to physiological registering apparatus account for a lack of quantitative knowledge of facts which should be particularly valuable in the theory of the visual perception of space. The author details his investigations into this subject with the aid of photography or more properly, kinetography.

The apparatus, a camera moving on a horizontal perimetric arc, records a continuous photograph (kinetogram) of a line across the eye in its horizontal meridian, taken on a slowly falling plate of extreme sensitiveness. As the eye moves, the sharply defined corneal reflex changes its

position, marking a curve on the negative corresponding in amplitude and form with the amplitude and extent of the eye-movements, of which the following types are enumerated.

First type. Fixation movements. The movements are, fundamentally, reactions to eccentric retinal stimulation, dependent on the tendency, developed during the first month of infancy, to move the eyes so that the point of interest will be seen by the visual center of the retina (macula). The velocity of these movements is uninfluenced by voluntary effort; their duration varies in direct proportion with the angle of movement. They are separated by comparatively long periods of rest, and are primarily, not periods of perception, but rather *interruptions of vision*, whose sole function is to turn the line of regard to an eccentric point of interest.

Second type. Eye movements in which the line of regard follows an object moving across the field: "Pursuit" movements. They vary with the apparent velocity of the target. The line of regard appears to lag behind the line of interest, and to overtake it from time to time by short eye movements of the first type. Unlike the latter, *pursuit movements are movements of clear vision*; in fact, it is only during pursuit movements that clear vision is possible. They have the character of habitual movements, and may persist after the occasion for them has ceased, are not separated by periods of rest, and so involve more continuous activity. Such movements are seen in people looking out of car windows or seated in a chair which is being revolved, while the object of fixation remains stationary.

Third type. Co-ordinate compensatory eye-movements by constant fixation of an unmoved object of interest is maintained during rotation of the head. They are not reactions to external stimuli, *i. e.*, not reflex motions, as shown by the absence of a reaction interval and of secondary corrective movements. They adjust themselves to all changes in the angle and rate of head movement, except those of extreme velocity, immediately and without error.

Fourth type. Reactive compensatory movements. These cannot be recorded by the photographic method

nor determined quantitatively, as an essential condition to their appearance is that the eye is closed.

They may, however, be studied by tactile sense, and are noted by the finger-tips placed on the closed lids. When the subject is rotated in a revolving chair, first in one direction and then in another, jerky compensatory motions are felt. They are not reactions to apparent movement of the environment, like the pursuit movements, since the eyes are closed, nor are they due to a co-ordinate efferent impulse like those of the third type, since the movement is passive.

Fifth type. These movements are unique, consisting in convergence and divergence in reaction to eccentric stimuli which, however, fall on disparate (heterologous) points of the two retinae, and induce movements in opposite directions, as in the attempt to fuse stereoscopic images. These movements are relatively slow, being apparently retarded by a tendency for each eye to move in the same direction as the other, and notwithstanding their reactive character permit a more or less clear perception of the field of vision during eye-movement.

Direct Control of the "Retinal Field:" Report on Three Cases.

LADD, GEORGE TRUMBULL. (*Psychological Review*, March, 1903.) The author has made certain experiments with a view to determine the answer to this question: "Can the sensations customarily called 'retinal,' which arise with the eyes closed and motionless, be made to respond to volition with respect to the form and color which they assume?" To two reports of, in all, some fifteen cases the following tentative observations are appended:

1. The control of the size and color of the images appearing before the eye when they are closed in the dark ("Eigenlicht") grows by practice. Trying begets habit. Individuals differ greatly in their native and acquired aptitudes.

2. The phenomenon cannot be completely accounted for by "selective" attention, resembling that with which we watch for and seize upon a word which we will to recall. An exalted activity of the color sensations (excitement, hyperaesthesia) is favorable to obtaining the best results.

3. These results cannot be wholly mediated by the

motor apparatus connected with vision by the eye. A certain feeling of strain is a common accompaniment of the first efforts to obtain a circle, cross, or triangle. One is occasionally conscious of focusing the eye upon this object. Pain in the eyeball, or back of it, frequently follows prolonged experimentation.

4. It is probable that the shapes and colors of our visual images are *centrally determined* to a far greater extent than has heretofore been supposed. The fusion, differentiation, contrast and sequence of our color sensations depend upon complex cerebral processes, the nature of which is determined, not simply by quality and intensity of the stimuli and their terrible effect upon the peripheral organism, but also in large measure by the associations and habits of those nervous centers of the brain that are correlated with the other centers and with memory, recognition, attention and choice. Color illusions in general point in the same direction, as do the phenomena of "color audition," which, if under this term we include the excitation of color sensations by auditory stimuli, are much more frequent than is ordinarily supposed. To them may be added the voluntary control in which colored images shall be stereoscopically united. Practice enables one at will to see the combined image of like-sized but differently colored squares, stereoscopically united, with either one of the two colors, or to fuse them into the color which is itself a mixture of the two.

5. These observations indicate that consciousness must in all its manifestations be considered as an active, discriminating and selective force, if we wish to explain the evolution of higher mental faculties. No theory, sensational, associational, physiological, or psychophysical, which regards consciousness merely "content-wise" and passively, can account for even the simplest of our experiences. Admitting this theory, more or less control over the shapes and color of objects appearing in the so-called retinal field or "Eigen-licht" seems consistent with all that we know about central physiology and mental life.

Improvement of Vision in Amblyopia from Non-use.

FREDENWALD, HARRY, Baltimore, (*Ophthal. Record*, Jan., 1903.) The nature of amblyopia in strabismus has

long been an object of inquiry, and whether strabismus itself will lead to amblyopia or the condition is congenital can only be proven, first, by "definite cases in which eyes with good vision become amblyopic from strabismus and, secondly, cases of marked improvement in vision in previously amblyopic eyes after their continued use."

Under the first heading four cases are cited, being reported by reliable authorities, while "the list of cases which tend to prove that an amblyopic eye may recover its sight is now becoming quite numerous," fifteen being referred to. "Besides these cases we may refer to those in which sight is lost early in childhood in consequence of double cataract." The author reports a case of divergent strabismus and traumatic cataract of about 70 years duration being removed with V= to movement of hand, two weeks after the operation and not improved with lenses; which within a year became = 10/40 with + 6.00, with + 15.0 he reads S, 1.5 D; and when seen about four years after the operation, with the same glasses V=6/XV and reads 0.5 German print fluently. The author feels no hesitation in placing this case with those referred to under the first heading as offering another instance of the genuineness of amblyopia from non-use.

The Physical Aspects of a Theory of Color Vision.

EDRIDGE-GREEN, F. W., London. (Copied in full from *Ophth. Record*, Feb., 1903.) The view which I wish to bring forward is that each optic nerve fibre is able to convey impulses corresponding to all kinds of light; that is to say, a very similar condition exists in the impulses which are transmitted along the optic nerve to that which is accepted for waves of light previous to their entering the eye. The limitation of the number of color sensations was thought to be necessary because it seemed physically impossible that a single fibre of the optic nerve could convey all waves of light. The facts of color vision can only be satisfactorily explained on the assumption that each optic nerve fibre does convey impulses corresponding to all waves of light. It occurred to me that if there were a transforming apparatus in the eye we could explain the facts. The telephone shows how this may be accomplished in the case of sound. I saw that the retina

was constructed in a manner theoretically perfect from this point of view. The percipient layer of the retina is made up of two kinds of elements, the rods and the cones. The portion of the retina corresponding to the central portion of the field of vision contains only cones. External to this spot the cones are arranged with one or more rings of rods round them, the single rings being round those cones which are nearest to the central portion. In the rods there is a rose-colored substance, the visual purple, which is very sensitive to light. This photo-chemical substance is found exclusively in the rods. I assumed that light falling upon the eye liberated the visual purple from the rods, just as heat would an ointment, and a photograph is formed. The decomposition of the visual purple by light chemically stimulates the ends of the cones, and a visual impulse is set up which is conveyed through the optic nerve fibres to the brain. I have examined the retinas of several monkeys after they had been kept in a dark room, and found that the visual purple was to be seen in the yellow spot, but situated between, and not in, the cones. This view gives a reason for a great many facts which were previously inexplicable. For instance, a bright light may fall upon the fovea (the center of the yellow spot) without producing any sensation, and a perceptible interval elapses before we are able to see with the yellow spot, after the remainder of the retina, the fovea being the last point to convey a sensation of light. The first fact we should expect, the cones being sensitive to light, the second corresponds to the diffusion into the yellow spot of the visual purple. All the facts of color mixing, contrast, and after-images can be explained by the hypothesis that the visual purple is the visual substance. A positive rose-colored after-image can be obtained after white light or any spectral color. The ordinary explanation of this, namely, that the action of the hypothetical red and violet fibres persists longer than those for green, cannot be true, because it is exceedingly difficult to obtain this after-image after spectral red, and very easy to see it after green. It would be against the whole principle of the theory that the red fibres should be excited most efficiently by green. But if we assume that the visual purple is the visual substance, then we have an easy explanation of the facts.

The fibres of the optic nerve pass to the visual center. I have assumed that the visual center transmits to the mind impressions of white light, and that by it objects are seen monochromatically, as in a photograph. The visual center is, therefore, acted upon by impulses caused by all rays of light, the color-perceiving center being concerned with the quality of the impulse within the power of perceiving differences possessed by that center, or portions of that center.

I will now apply this theory to color-blindness, and it will be seen that it gives a simple explanation of the facts.

Cases of color-blindness may be divided into two classes, which are quite separate and distinct from each other, though both may be present in the same person. In the first class there is light as well as color loss. In the second class the perception of light is the same as the normal sighted, but there is a defect in the perception of color. In the first class certain rays are either not perceived at all or very imperfectly. Both these classes are represented by analogous conditions in the perception of sounds. The first class of the color-blind is represented by those who are unable to hear very high or very low notes. The second class of the color-blind is represented by those who possess what is commonly called a defective musical ear. Color-blind individuals belonging to this class can be arranged in a series. At one end of this series are the normal sighted, and at the other the totally color-blind. The colors appear at the points of greatest difference, and I have classified the color-blind in accordance with the number of colors which they see in the spectrum. If the normal sighted be designated hexachromic, those who see five colors may be called pentachromic; those who see four, tetrachromic; those who see three, trichromic; those who see two, dichromic; and the totally color-blind, monochromic. There are many degrees included in the dichromic class. There may or may not be a neutral band, and this is the widest in those cases approaching most nearly to total color-blindness. I have recorded a case of a patient who was color-blind with one eye. It is an interesting fact that for form vision the color-blind eye was much the better of the two, and he could recognize fine lines in the spectrum with this eye which were not visible

to the other. He saw the two ends of the spectrum tinged with color and the remainder gray. It will be noticed that his color sensations were limited to the extreme red and the extreme violet, namely, those colors which present the greatest physical contrast to each other. Neither the red nor the violet appeared of the nature of a primary color, but gave the impression that they were largely diluted with grey. A theory of color vision must account for a case of this kind and also for the other varieties and degrees of color-blindness. The trichromic are a very important class, and any theory must account for the fact that they see yellow as red-green and blue as violet-green. As we should theoretically expect, when there is shortening of the spectrum the centers of the colors are moved toward the unshortened side.

I will conclude by showing how this theory will explain the trichromatism of normal color vision. It also explains why certain persons see spectral yellow as red-green and spectral blue as green-violet. In past ages all saw the rainbow made up of only three colors, red, green, and violet. When a new color appeared between the red and green (yellow) it is obvious that a mixture of red and green would give rise, not to red-green, but to the color which had replaced it, namely, yellow.

Mydriatic Drugs and Their Active Principles.

OLIVER. CHAS. A., Philadelphia. (*Jour. Amer. Med. Assocn.*, Feb. 21, 1903.) "The drugs spoken of as mydriatics are ophthalmologically divisible into four classes—analgesics, mydriatics, iridoplegics and cycloplegics. They always act locally and local applications never effect the fellow organ in a similar way."

1. Most prominent among the mydriatic agents are: holocain, cocain, eucain, euphthalmin, homatropin, mydrin, atropin, scopolamin, daturin, hyoseyamin, hyosin and duboisin. As is well known, many of these alkaloids, although differing by but one or two elemental atoms each, or even when absolutely isomeric, have variable physiologic actions on one and the same series of ocular structures.

3. The chief effects of this class of therapeutic agents on the eye consist in external and internal analgesias com-

bined with local paralyses of the sphincter muscles of the iris and ciliary body. By some observers most of the drugs (particularly atropin, daturin, scopolamin, hyoscyamin and duboisin) are supposed to exert simultaneous excitatory actions on the radiary fibers of the iris and the ciliary body. Some of the drugs are said to contract the blood vessels and to act on the peripheral ends of the nerves. A number of authorities believe that cocain-, holocain- and eucain-mydriases are due to local irritation of the sympathetic nerve endings in the iris (both vaso-constrictor and pupil-inhibitory fibers).

The local effects of the drugs are increased by bodily rest, with non-usage and non-exposure of the ocular organs. Cold applications diminish both the primary and secondary actions of the drugs. Heat tends to promote both these results.

All solutions should be freshly prepared or made up in small quantities and kept for brief periods of time; care must be used to prevent their passage into the lacrimal and nasal passages during their instillation.

The drugs which are employed for the definite and determinate purpose of pure mydriasis in ophthalmology are comparatively few. In the writer's hands they are limited in the order of their relative values to the following: euphthalmin, homatropin, mydrin and ephedrin.

Euphthalmine usually used in the form of hydrochlorate—2 drops of a 5 per cent. solution produce an almost maximal mydriasis lasting two or three hours under strong light stimuli, pupil returning to its normal size in twenty-four hours. The ciliary muscle is slightly affected.

Homatropine usually used in the form of hydrobromate is used in 2 per cent. strength as a mydriatic and in greater strength for a cycloplegic; a drop of 1;500 strength instilled into the conjunctival sac every five minutes for five times will produce a maximal dilatation of the pupil in three-quarters of an hour, returning to normal in 14 to 18 hours. Cocain increases the effect and is used in combination with homatropine in gelatine discs containing one-fiftieth of a grain each.

Mydrin is an artificial preparation of one part homatropine to 100 parts ephidrin in a 10 per cent. aqueous so-

lution; the pupil reaches its maximal dilatation of 4 to 7 mm. in 30 to 35 minutes, and returns to normal in four to six hours' time. This mixture is more effective as a mydriatic than either of its constituents alone. They produce a loss of accommodation of one or even two diopters at maximum dilatation.

Ephedrin is used in a 2 per cent. solution, one or two drops producing almost complete mydriasis in an unirritated eye in 50 minutes, and lasts for about 12 hours. The action on the ciliary muscle is very slight.

The Value of Salicylate of Sodium in Larger Doses in Inflammatory Eye Disease.

GRADLE, H., Chicago. (*Ophth. Record*, Feb., 1903.) The author agrees substantially with Gifford (see *Annals Ophth.*, Jan., 1903. page 131) and believes that the value of the agent is not as much appreciated as it deserves; particular stress is laid upon giving the drug in large doses: An adult requiring 20 grains at least 4 to 5 times a day, while if 25 grains can be tolerated 5 or 6 times a more decisive influence is quickly obtained.

Good results have been obtained by the author in episcleritis, deep scleritis, minute superficial corneal infiltrates, phlyctenular keratitis, some cases of non-syphilitic keratitis and nodular sclero-keratitis; in iritis the drug has been a disappointment although it benefits many patients, reducing the severity of the symptoms and probably hastening the course, no matter what the etiology. Traumatic irido-cyclitis with sympathetic irido-cyclitis of the other eye. In syphilitic keratitis, spontaneous cyclitis the author's results have not been good.

"In acute inflammations of the retina, or of the optic nerve, of unknown origin, I have never seen any results from salicylate. The same I must affirm of retro-bulbar neuritis, which in my observation has always run a self-limited course, ending in partial or complete recovery of sight.

A very prompt influence has been observed in rare instances of non-traumatic and non-suppurative *tenonitis* which I have met with."

Recurrent Formation of Vesicles on the Cornea and Keratalgias after Injuries of the Surface of the Cornea.

STOOD, W., Barmen. (*Archiv. Ophthalm.*, Jan., 1903.) The clinical picture is described as following "the healing of a superficial injury of the cornea, without involvement of Bowman's membrane, there develop after a varying interval, in which there have been but slight if any attacks of pain, clear, watery vesicles at the site of the previous injury, accompanied by severe ciliary pain and signs of inflammation. The surface of the vesicles becomes cloudy, breaks down, and is torn away, to be replaced in a short time by new transparent epithelium." Some cases may go on to ulceration if infected. The pain is more severe on awakening from sleep, the patient being unable to open the eye, that the lid is adherent and when the eye is forced open they have a sensation as of something torn away. Injuries to the epithelium with a sharp instrument or by cinders or dust do not lead to bullous keratitis; there must always be an injury producing a forcible tearing of the epithelium. The author concludes that the process is not a neuritis of the nerve-endings in the corneal epithelium with consecutive trophic disturbances, but seeks the explanation in the anatomical relations and position of the deepest cylindrical layer of the epithelium, which, according to Rollett, Lott and Langerhans, adheres to Bowman's membrane by means of little processes which pass into the clefts and furrows of the membrane. In the forcible injury the entire epithelium is stripped off for a distance and perhaps Bowman's membrane is crushed in its anterior layers, so that the new epithelial cells pushing in from the margins of the defect find an altered base upon which to rest and their adhesion to it is less strong. The new-formed epithelium rather rests simply upon Bowman's membrane, and at night it becomes attached to the lid and is loosened and its nerve-endings injured when the lid is opened. There follows then a passage of liquid from the parenchyma of the cornea through the nerve canals in Bowman's membrane so that a vesicle is formed.

If the vesicle is large, the overlaying epithelium is so

altered in its nutritive relations that it breaks down. If small, when the eye is opened the subepithelial transudation is absorbed.

This conception of a poor development of the foot-plates of the basal cells and of their weak attachment to Bowman's membrane explains also the good effects of massage. First, the entrance of the cellular processes into Bowman's membrane is facilitated and the adhesions which form between cornea and lid during sleep are gradually loosened instead of being abruptly ruptured by the sudden opening of the eye, with injury to the cells. The author recommends the gentle massage of the eye with 1 per cent. yellow oxide of mercury or boracic acid salve at bed time to coat the cornea and lid and prevent them adhering. When the vesicles have formed, the walls are removed with the forceps and the epithelial covering allowed to return under antiseptic dressings.

Bottle Finishers Cataract.

ROBINSON, WILLIAM, London, Eng., (*British Medical Journal*, Jan. 24, 1903.) The writer reports six cases of this affection, preceded by an interesting analysis of its pathology and clinical symptoms. Eighteen out of seventy-five (1 in 4) hard cataracts operated upon during the past year at the Sunderland and Durham County Eye Infirmary were in bottle-finishers, there being only 200 or 300 bottle-finishers in a population of nearly a million and a quarter in the country.

"Amongst bottle-makers the "bottle-finisher" is almost always the victim of the disease, but occasionally the "founder" suffers. The "founder" has to push with a long iron rake the materials away from the mouth of the furnace into which he has thrown them, and consequently he has to look occasionally into the intense light and heat. The bottle finisher, holding the bottle on the "punty" in his left hand, with an iron rod in his right, looks directly with both eyes into the sea of molten glass, and takes just sufficient to form the rim on neck of the bottle. The time in which he is obliged to look into the furnace whilst he gets the metal for the rim of each bottle is about three seconds, so that at each shift his eyes are exposed to the glare of the furnace for at least sixty-six minutes, or about

five and a half hours a week. This is the man, therefore, whose lenses become opaque.

The disease begins about the same time in both lenses, so that they usually present the same appearances when the worker applies for treatment. It commences as often as not before the age of 50 years, and not uncommonly before the age of 40 even.

The bottle-finisher is often able to work for some years after the opacities begin, especially if the pupil be kept dilated by atropine; the great improvement of the sight by atropine is due to the fact that at first the periphery of the lens is clear. The opacity first appears at the posterior pole of the lens, immediately under the posterior capsule, and is shaped like a disc or coin, which by oblique illumination is distinctly brass-colored.

The disease is due to the great heat and light of the furnace at which the bottle-finisher works, but why does the mischief always begin at the posterior pole of the lens? The explanation is as follows:

1. The nodal point is situated at the exact spot where the cataract begins, and here all the principal rays, falling on the lens cross and pass without refraction, so that this point of the lens receives the brunt of all the direct rays, harmful by their intensity and heat from the furnace, and is therefore the point first to suffer injury.

2. All the rays from the furnace, except the direct and principal rays mentioned above, which have fallen on the cornea when they reach the anterior surface of the lens, are again refracted, so that when they reach the posterior surface of the lens they are much crowded together, and are consequently more injurious there than at any other part of the lens.

3. The bright light of the furnace contracts the pupil so that the iris shields the periphery of the lens at first from damage.

The disease can be prevented by workmen wearing dark blue spectacles, for glass has the property of allowing only 30 per cent. of the heat rays to pass through it; and, if the glass is dark colored, many of the light rays would also be cut off. Although when advised to do so, bottle-makers offer various excuses; there is no valid objection

to the use of the spectacles while they are at work, and it would be very greatly to their advantage to wear them.

Good Vision an Important Factor in the Educational Process.

RISLEY, S. D., Philadelphia. (*Annals of Gynecology and Pediatrics*, March, 1903.) "Statistics of school examinations, and the daily routine of the ophthalmic surgeon have shown that a large percentage of our children start in life with congenital defects which either impair the sharpness of sight or render painful all continued use of the eyes in occupations which demand accurate vision at the near point. These anomalies of vision are the cause, in large numbers of persons, of red and weak eyes, pain in the brow and back of the head, sick headaches and many other reflex nervous symptoms. It follows that many school children who get on badly at their books, but are bright, active, energetic and successful elsewhere, remain at the foot of the class because of their defective eyes.

It is a curious fact that children are less prone to complain than are their elders; possibly from a lack of appreciation of the untoward conditions under which they labor. To many children the act of vision has always been more or less painful or unpleasant, and therefore it seems to them quite the normal condition, and so they suffer on without complaint, for how are they to know that this is not the general experience of mankind? They are, nevertheless, handicapped by this unrecognized defect, and without comprehending why or wherefore find themselves distanced in the race.

I have demonstrated by statistical studies in the public schools of Philadelphia that only 11.19 per cent. of the pupils had emmetropic or model eyes, while 88.81 per cent. manifested some congenital defect. The great significance of this fact was borne out in the more detailed study of the relative condition of these two classes of eyes under the strain of school work. In the first place the model eyes remained in uniform percentage in all ages of school life, enjoyed a higher acuity of vision and were relatively free from pain and disease; while on the other hand the defective eyes, especially those with astigmatism, had a lower sharpness of sight, suffered from pain, headache and reflex nervous symptoms, red eyes, etc.

and that furthermore, from these was recruited a steadily advancing percentage of near-sighted eyes with their characteristic pathologic condition, as the children advanced in age and school progress. It was obvious from these figures that there was a definite relation of cause and effect between these congenital defects of vision, and the well-known harmful results to many eyes from the strain of school life.

Professional experience has taught that the correction of the errors of refraction by glasses, removed not only the pain and impairment of vision, but that under their use the eyes bore the strain of near work without injury. It was rational, therefore, to urge that no child should be admitted to the schools until it had been shown by examination that the eyes were fitted to safely undertake the coming struggle with books.

Many practical difficulties presented themselves. The necessary cost entailed by professional examinations forbade its adoption, but fortunately an expert is not needed for the detection of impaired vision.

A card of test letters was published with instructions as to its employment printed on the back and distributed with a letter of instruction to all the schools. The plan required the teacher of each class to determine the sharpness of vision of each eye of every member of the class at the beginning of every school year and to record the findings on a blank furnished for the purpose. If the acuity of vision fell below a prescribed standard a card was provided to be sent to the parents of the child on which the fact of the defective eyes was briefly stated and professional examination advised.

The cards were distributed to the schools in January, 1902, with a general letter of instruction to the principals and the examinations begun. Before many days children, bearing the card of advice presented themselves at the various clinics and consulting rooms in the city. A number of these fell into my own hands at my Wills' hospital clinic so that I had an opportunity to verify the practicability of the plan. Without exception every child presenting these cards was unquestionably in need of professional advice. By far the larger number needed glasses for the correction of some form of anomaly of refraction, and were already suffering injury from the strain of school work."

A Simple and Convenient Method for the Mounting of Macroscopic Specimen.

MORTON, H. McI., Minneapolis. (*Ophthal. Record*, Jan., 1903.) Greef's method is described in detail:

"First: Harden the fresh specimen in 10 per cent. formalin for from two to four days.

Second: Cut the eye as you desire to mount it. If to show the posterior or anterior segments, cut equatorially and if to show the lateral or longitudinal eye, cut meridionally.

Third: Wash in distilled water for ten minutes.

Fourth: Dry specimen carefully with cloth (if it is desired to remove the retina, this may be done with a cloth or a small brush).

Fifth: Make the eye fast to the back of the glass mounting jar with gelatine (simply mix the gelatine with a little water and heat slowly for a few hours or over night).

Sixth: After the specimen is fixed to the posterior wall of the cell let it dry for two or three minutes until sure it is well attached.

Seventh: Fill the glass jar with 10 per cent. (or even 4 per cent.) formalin in watery solution.

Eighth: After very thoroughly drying the top of the cell fasten it down with gutta-percha cement. One may also cement a small clasp on the top of the glass jar to hold the label.

Ninth: Paint about the edges and over the gutta-percha with white (or any color) paint."

Photographic Experiment with Nature's Lenex

WATSON, PROF. W. F. (*Scientific American*, April 4, 1903.) "The eyes of animals possess various devices for the refraction of light and the formation of images upon the retina. The crystalline lens and the cornea appear to be the most important of these devices." These animal structures are so delicate the utmost care must be used in handling them to prevent their being injured.

The photograph of a flea is reproduced, which was made as follows: "In the center of a pasteboard square a round hole is cut for the reception of the lens. This is supported in a horizontal position by a wire frame. * * * Considerable skill is required in dissecting the eye without

injuring the lens and also in transferring it, which must be done with a camel's hair brush dipped in aqueous humor. The lens is next incased in a pasteboard pill-box. With a cork-borer one hole is made in the bottom and another in the top piece. The hole in the shallower piece, which is to go below the lens, should be about double the diameter of the other. These holes will serve as diaphragms. The pill-box parts are cemented to the pasteboard square, inclosing the lens, the shallower part below and the deeper part above."

The lower and shallower part should be cemented on the pasteboard square before the lens is placed in position. The camera must be supported pointing directly downward with its lens removed. While in this position the pasteboard bearing the natural lens is carefully inserted in the instrument and the surrounding parts made light-tight. All of these manipulations must be accomplished without inverting the natural lens or turning it upon edge, on account of its liability to injury. The object is focused in the usual way and the picture taken by transmitted light. When first removed from the eye, the surface of the lens is very perfect. But upon exposure to air it immediately begins to dry, and thus minute irregularities develop upon its surface. If the surfaces of this lens could be kept moistened, as the cornea of the living eye is kept moistened by the eyelid, very perfect photographs could be made with it. It seems not only possible, but even probable, that if sufficient experimentation could be made on this lens, a method could be found for hardening it, without destroying its original shape and transparency. Experiments so far made, having this object in view, have not been successful. The liquids which were used as hardeners all made the lens either opaque or opalescent. In fact, this lens is very sensitive to the action of liquids in general. In making these experiments, about the only liquid which could be found which did not impair the lens in some degree was aqueous humor.

The enclosing of the lens between two convex surfaces as two watch crystals and sealing the edges and covering the surfaces, except the holes for the diaphragms, with

black gummed paper makes a more successful mounting, and this can be mounted in a camera in the ordinary way and used with reflected light. A multiple image picture was also made by using the corneal lenses of the eye of a beetle, the process being very similar to micro-photography.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

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(Quarter Ending March 31, 1903.)

Asepsis and Prophylaxis in Ophthalmology.

PANAS, Paris. (*Archives d'Ophthalmologie*, Jan., 1903.)
Panas believes that whereas bacteria are rendered inoffensive rather than destroyed by the antiseptics that are ordinarily used, the term "asepsis" is to be preferred to that of "antisepsis." In preparing an eye for operation he washes the lids with sterile water and soap, the parts then being rubbed with cotton which contains a small amount of ether. This done, the lids are rubbed with sterile cotton saturated with an oily solution of iodide of mercury, four parts to one thousand. In preparing for a cataract extraction, this procedure is done the night before and the eye is covered by a roll of sterile gauze and a bandage. When about to operate, the eye is irrigated with a 4 per cent. strength boric acid solution, or a bichloride of mercury solution one to five thousand strength, or an oxy-cyanide of mercury solution of one to fifteen hundred, or a bisodide of mercury solution of one to twenty thousand strength (all aqueous solutions). Schiötz's method of epilating cilia has been personally practiced by him. He states that the hands of the operator and his assistants, as well as his instruments, are all to be thoroughly sterilized.

He has found that the employment of rigid aseptic treatment has reduced the number of enucleations to

twenty in a series of two hundred cases of penetrating ocular wounds; sympathetic ophthalmitis never having been observed. In a clinic of twenty thousand cases the author has observed sympathetic ophthalmitis in but two cases.

He says that except where foreign bodies are accessible, the attempts at removal should be postponed until the eye is quiet unless persistent symptoms of glaucoma are present. He has found that among local antiseptics a one to five hundred strength aqueous solution of methyl violet is the best. He believes that in his plastic and suppurative affections of the globe, general treatment is of importance, mercury administered either by injection or by inunction being of particular value.

Serum therapy in his hands has proven efficient in diphtheretic ophthalmia, and in serpiginous ulcer; antipneumococci serum being given in the later condition since such affections result from a pneumococcus infection.

Where the serum treatment is not available, an attempt should be made to free the organism from toxins by way of the natural passages.

He enumerates the various precautions which are to be taken against the dissemination of ophthalmia neonatorum, blenorrhagia and trachoma, and describes the methods of protection which are available to those subjects whose occupations subjects them to intoxicants by chemicals or to mechanical injuries.

Surgical Intervention in Paralysis of the Ocular Muscle.

LANDOLT, PARIS. (*Archives d'Ophthalmologie*, January, 1903.) Landolt reports six cases in which more or less complete paresis of one of the exterior ocular muscles was successfully treated by advancement of the affected muscle. The results demonstrated that muscular advancement is an operation which is indicated in paralysis. In paresis of slight or of moderate degree the ocular motions can thereby be restored to normal. Where the paresis is more marked a resection should be added. Where the paralysis is complete, binocular vision is obtained only when the subject is gazing directly ahead or toward the side of the paralyzed muscle. When an advancement or resection of a paralyzed external rectus is not sufficient,

the author adopts advancement of the homonymous muscle rather to perform tenotomy of its antagonist.

Tenotomy, he says, is admissible in complete paralysis of long standing—where the antagonist has undergone changes which prevent its relaxation, and where binocular vision is absent on account of blindness of one eye.

Histologic and Pathogenic Study of a Case of Microphthalmus.

MONTHUS and OPIN. (*Archives d'Ophthalmologie*, Jan., 1903.) The case seen by these authors was that of a full term infant which died shortly after birth. They make the following resumé of the case. All parts of the orbits were normal except the optic nerves and globes. The optic nerves showed arrested development with a melanosis of the upper portions. All of the parts of the eye are present, although they were much reduced in size. The sclerotic and the chorioid were normal. The crystalline lens was still enveloped in its vascular tunic, this membrane being attached to the chorioid by an atrophic hyalo-ciliary veil. The retina possessed all of its layers except that of the rods and cones, and was detached and folded upon the vitreous humor. The vitreous humor did not show any trace of hyalitis, but had undergone an arrest of development at an early period of the child's existence, possibly the second or third month. The fibrillary connections between the vitreous humor and the retina described by Tornatola, were distinct (the traction exerted by this means by the contracted vitreous apparently explained the retinal detachment). No inflammatory lesions were present, so that the microphthalmus may be attributed to the precocious arrest of development, affecting especially the optic nerve and vitreous body. This view, they say, if supported by the bilateral nature of the affection, by the coexistence of multiple malformations, and by the absence of the occipital lobes. These changes they ascribe to a general uterine infection by syphilis, tuberculosis, etc.

The Exploration of the Pupil.

COPPEZ, Brussels. (*Archives d'Ophthalmologie*, January, 1903.) Coppez concludes his article with the following table or method of pupillary examination:

A. Photo- motor reflex. (daylight):—

1. Pupils in a state of repose.

(a) Absolute diameter of the pupils:

(b) Absolute diameter of each pupil.

2. Pupils in a state of action.

(a) Direct Reaction of each pupil:

(b) Consensual reaction of each pupil:

(c) Reaction to convergence and accommodation.

Physiological inequality and lesion of the dilator (weak illumination):—

(a) Relative diameter of the pupils:

(b) Instillation of cocain on the dilated side.

Spasmodic mydriasis: supplementary dilation nil.

Paralytic mydriasis: maximum dilation.

Pupil normal supplementary: moderate.

(c) Illustration of atropin on the dilated side.

(Paralytic miosis; dilation feeble spasmodic miosis; dilation normal.)

Regeneration of the Vitreous Body.

HALMERS, Gand. (*Archives d' Ophthalmologie*, January, 1903.) As a result of histologic studies on the eyes of rabbits. Halmer's concludes that reparation of the vitreous body is due to exoplasmic products from the supporting tissues of the retina. The embryonic vitreous body he says shows intimate connections with the internal sheath of the secondary vesicle; the adult vitreous shows connections with the sensorial layer (at least in certain species); the vitreous body of new formation is elaborated at the expense of the retinal neuroglia; the vitreous body should be classed among the tissues of ectodermic origin; and lastly, the vitreous body assimilable in the exoplasmic products which are found in the neurexis.

On the use of Adrenalin in Ocular Therapeutics.

COPPEZ, Brussels. (*La Clinique Ophthalmologie*, 10th, Jan. 1903.) The instillation of one to one-thousand strength solution of adrenalin into the eye is not followed by any disagreeable subjective sensation, its maximum effect of local anemia being produced in about two minutes time. The general effect of the drug is not well known. According to some authors it is not toxic. Intravenous injections

produce a marked increase in the intra-vascular tension. Accordingly to Reichert it is a true antidote to opium; it being equally indicated in the collapse which follows anesthesia. When it is used with cocain it increases the anemia and anesthesia which is produced by the latter, and prevents the syncope. The effect which is obtained on the deep tissues of the eye by subconjunctival injection is doubtful. Instillations of the drug are recommended in those cases in which lacrimation and redness of the eyes are easily produced. Associated with cocain, atropin and eserine, it markedly increased their actions especially where there is marked ocular congestion. The author employs two to five parts of adrenalin solution one to one thousand to eight parts of the solvent. In occlusion of the lacrimal canal the injection of the adrenalin he says will reveal the nature of the obstruction, since in catarrhal swelling this alone restores the permeability. In all operations on the eye it renders and maintains the operative field bloodless. In fulminating tuberculosis or epitheliomatous tumors or ulcers of the lids, marked improvement in the condition has followed the use of moist dressing of one to five thousand strength solution of the drug.

Treatment of Xanthelasma of the Lids by Electrolysis, Remote Results.

VILLAD and BOSE, Montpellier. (*La Clinique Ophthalmologique*, 10th. January 1903.) Villard and Bose after an intradermid injection of cocain solution introduced two needles simultaneously just without the borders of the pigmented area and passed them parallel to one another beneath the skin for a distance of ten millimeters. As soon as the needles were in position the current was gradually turned on until it reached a strength of six or eight milliamperes, and was continued for two to four minutes and then gradually reduced. The needles were then withdrawn. The number of punctures they say can be determined by the size of the affected area. During the passage of the current the skin assumes a greenish color and becomes distended by gas. A simple oily dressing is the only after treatment which is necessary. The author concludes, that electrolysis is the operation of choice in the affection because it leads to no loss of tissue, and offers a perfect

aesthetic result. The essential condition of the operation is to destroy all points of the xanthelasma in order to prevent its return.

On the Seeing of Colored Spots in the Visual Field
"Colored Scotomo."

LEVI, STUTTGART. (*La Clinique Ophthalmologique*, 10th. January, 1903.) Levi reports the following cases: A twenty-seven year old female whose family and personal history, except for some presence of dysmenorrhea and colored scotomata, was negative, stated that three years previously she seemed to see a black spot on her right cheek which shortly afterward assumed a reddish tint. A few months later a similar, though less marked condition appeared subjectively before the left eye. On looking steadily at the subjunctive colored spot it became as red as "Fire" and seems to emit flames in all directions. The size of the spot was inversely proportional to the distance of the object which was fixed. In a weak illumination the spot became surrounded by a blue ring and the radiation of red rays ceased. Except for the presence of astigmatism in the left eye, objective examination was negative.

The author believes that the condition was the result of organic lesions which were situated in the retina, since a disturbance in the visual area of the cortex would have produced symmetrical scotomata.

Jequiritol.

COPPEZ, Brussel. (*La Clinique Ophthalmologique*, 25th. January, 1903.) Jequiritol, Coppez says, is prepared by Merck in four strength, each successive number being ten times stronger than the preceeding one. The instillation of number I and number II produce but little pain, while numbers III and IV produce severe smarting, and should therefore, be preceded by the employment of a five per cent. strength solution of cocain.

The author begins with a ten milligramme dose of number III and increases the amount ten milligrammes daily until a strength of forty milligrammes is reached. After this similarly increased strength of number IV are used. Reaction, he says, usually appears on the third

day and though painful, rarely confines the patient to bed. He is generally content with the production of two reactions. In several cases he used jequiritol serum to control the severity of the reaction, but only once from necessity. By employing jequiritol acute outbreaks of trachoma may be controlled in ten or twelve days and the more radical operative methods of cure can be at once adopted. He has used instillation of the number I strength solution in parenchymatous keratitis and chronic conjunctivitis with considerable benefit. In one case of persistent sinus disease due to tubercular disease of the malar bone, packing the exposed area with weak jequiritol gauze was followed by a rapid disappearance of the suppuration.

Emotional Glaucoma.

TROUSSEAU, Paris. (*La Clinique Ophthalmologique*, 10th. February, 1903.) Trousseau states that the anatomical lesions described as pathogenic of glaucoma are rather the results of the evolution of the disease. The question he thinks can only be determined by a study of eyes which are predisposed to glaucoma before the development of any secondary changes. He reports four cases in which marked emotional disturbance was followed by the development of an acute attack of glaucoma. He remarks that he has observed many other cases.

On the Treatment of Total Recent Staphyloma of the Cornea by Extraction of the Lens.

CONSTANTINESCO, Roumania. (*La Clinique Ophthalmologique*, Feb. 10th, 1903.) Constantinesco reports five cases of recent total corneal staphyloma in which the deformity is said to have been completely relieved by extraction of the crystalline lens. This result is due, he believes, to the permanent reduction of intraocular tension and to the contractile power of the adherent iris. In long standing cases this power of the iris has been lost and the operation is therefore contraindicated.

The Radical Cure of Dacriocystitis by Extirpation of the Lacrimal Sac; Remote Results.

ROLLET, Lyons. (*Revue Generale d'Ophthalmologie*, Jan. 31st, 1903.) Rollet gives a resumé of twenty-five

cases of dacriocystitis of the following type; lacrimal discharge, lacrimal tumors, perilacrimal phlegmon, lacrimal fistula, tubercular dacriocistitis, and prelacrimal tumor. The postoperative period he says, varies between six months and six and a half years.

In twenty-four of the cases suppuration ceased immediately after the operation which left a narrow scar that later disappeared. In none of the cases were ectropion, keloid, or adherent cicatrix noted. Three failures are ascribed to an incomplete removal of the sac and included two cases of lacrimal tumor and one of perilacrimal phlegmon. The second symptom of dacriocystitis he states is lacrimation, which was effected as follows by the operation: In eighteen cases there was not any lacrimation; in two cases it was insignificant; in one it was intermittent; in three it appeared only with the influence of exposure to wind; while in three it persisted. In three of the cases the lacrimation lasted a few months, to disappear completely.

He states that three theories have been advanced to explain this disappearance of the lacrimation: first, the formation of a new lacrimal passage (anatomical examination and clinical tests disprove this theory); second, the lacrimation is simply a result of the irritation, and disappears when this condition is removed (and that normally evaporation is sufficient to carry off the excess of fluids); and third, in those cases, in which the lacrimation subsides slowly there is atrophy of the lacrimal gland;—the anatomical studies of Tscherno-Schwartz supporting this view. The atrophy is ascribed to the intimate nervous relation between the existing secretory and excretory apparatuses.

Note on Egyptian Ophthalmia and Granulation in Egypt.

BAUDRY, Lillie. (*Revue Generale d'Ophthalmologie*, Jan. 31st, 1903.) From a recent study of Egyptian ophthalmia, Baudry arrives at the following conclusions: I. Egyptian ophthalmia, as a clinical entity does not exist. This name has improperly been given to trachoma complicated by a catarrhal or a purulent state of the conjunc-

tiva. II. Histologically and clinically, trachoma in Egypt is absolutely identical with European trachoma and should not be considered the consequence of a catarrhal, purulent, or pseudo membranous conjunctivitis. III. The climatic and hygienic conditions peculiar to Egypt explain the frequency and diffusion of trachoma and conjunctivitis in that country. IV. The catarrhal and purulent conjunctivitis which is endemic in Egypt, becomes epidemic during the summer season and not only attacks the Europeans, but especially the indigenous infants who contaminate one another. V. Thanks to the progress of hygiene, the number of the afflicted cases is notably diminishing and it is no longer correct to state that almost all the Egyptians are afflicted with the affection. VI. In order to efficaciously fight the causal element of contagion it is indispensable to isolate these cases who are afflicted with the secreting form. Special hospital or at least separate wards for the cases thus afflicted are a necessity, as are likewise those projects of public utility which are capable of improving the hygienic and social state of the poorer classes.

Anatomical Examination of the Eye Affected by Pigmentary Retinitis With Zonular Scotomata.

GONIN. (*Annales d'Oculistique*, December, 1902 and January, 1903.) The eye studied by Gonin was that of a patient who was affected by an unilateral pigmentary retinitis of a form which was considered typical of congenital degeneration and probably the most recent in point of evolution, which has been described in detail. From this case the author draws the following conclusions: I. The retinal pigmentation in pigmentary retinitis has its maximum in the region of the equator and at the periphery of the equator. II. The principal phenomenon is not that of pigmentation but is an atrophy of the sensorial elements which form the external retinal layers. III. This atrophy of the perceptive elements commences in the middle region of the retina and localizes itself, more exactly than the pigmentation is a circular zone which spares for a longer or shorter time the extreme periphery and the posterior pole. IV. This primary localization of the alterations of the retina corresponds in course of

evolution with the presence of zonular scotoma in case of pigmentary retinitis. V. The retinal degeneration may have its maximum in a circular zone, even when the scotoma in the visual field has no longer the form of a perfect ring. VI. The immediate cause of the degeneration of the external layers consists in a slow atrophy of the choriocapillaris. VII. The reason of this atrophy of the choriocapillaris in the median zone is the mode of distribution of the arteries of the chorioid, the medium region being supplied by their terminal ramifications. VIII. A sclerosis of the retinal and chorioidal vessels depends probably on the same process. IX. The sclerosis of the retinal vessels may have as an effect an atrophy of the internal retinal layers, but would not be the direct cause of the degeneration of the external layers of the pigmentation. X. The hyperplasia of the connective tissue is also not a cause of the atrophy of the perceptive retinal elements, and if this hyperplasia is noted in advanced cases its importance is only secondary. XI. The retinal pigmentation is consecutive to the degeneration of the external layers. XII. The pigment arises from the pigment epithelium, and the epithelial cells form the principal agent of its transportation into the retina. XIII. The retinal pigmentation has no connection with the presence of varicosities of the hyaloid membrane. XIV. The perivascular spaces and the lacunae resulting from the retinal atrophy facilitate the penetration of the pigment cells into the retina, but these cells, owing to the active movements with which they are endowed, are capable of making their way independently to the vitreous body. XV. The ensemble of the histologic alterations which constitute congenital pigmentary retinitis consist of a degenerative nature rather than an inflammatory one, and appears to be attributable to a disturbance of nutrition under the influence of a progressive sclerosis of the nutritive vessels of the eye.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

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CHICAGO.

(Quarter Ending March 31, 1902.)

Amaurosis from Mushroom Poisoning.

GIULIO, Valetti. (*Annali di Ottalmologia*, XXXI. Fasc. 3.4. 5.) The symptoms from mushroom poisoning are sufficiently familiar, since hardly a year passes without a considerable number of cases being recorded in the public press of intoxication from ingestion of this article of food. The use of mushroom for food is extremely ancient; in China, in India and in Africa it has been used from prehistoric times.

On account of the abundant albuminoid substances which it contains, it has been called "the meat of the poor," and for this reason has been popular, especially in the country, as a substitute for animal food, cheap and easily procured. Although people living in the country are more accustomed to distinguish between the edible and the poisonous varieties than persons residing in cities, yet cases of poisoning are everywhere frequent.

The general symptoms accompanying mushroom poisoning are as a rule the following: First, a period of excitement, followed by headache, cramps, convulsions, miosis (objects appear blue or violet), tenesmus of bladder and rectum, sweating, patches of ecchymosis, disturbances of the alimentary canal, heart and lungs, collapse and death. With the exception of certain variations, especially in the nervous symptoms, this is a general outline of the characteristic syndrome. In regard of the organs of sense, Valenti has examined the literature at his disposal and was unable to find any notice of visual disturbances in consequence of mushroom poisoning, such as occurred in a

case he had occasion to observe and which he describes in full.

A. S., a man aged 26, of robust constitution, no local or general disease; father and mother in the best of health. Last September he ate a dish of mushrooms of the kind commonly called where he lives "prataioli," of the botanical species *amanita*. He immediately experienced gastro-intestinal distress, followed the next day, with vomiting and constipation and with ischuria so complete that the catheter had to be used. The first night after the poisoning he had a severe pain in the right eye, aggravated by any movement of the eyeball, and was unable to see objects only at their periphery, not in the center. These visual disturbances grew gradually worse until on the twenty-second day, he could distinguish only light and darkness. Very shortly the same defect began to appear in the left eye, which also became blind in the course of a few days. He was admitted to the hospital when the objective findings were as follows: The lids and lachrymal apparatus were intact, the conjunctivae of both eyes normal, but the pupils were widely dilated. He now had bare light perception. The ophthalmoscope revealed anemia of the papillae, but no trace of irregularity in their outline. The shrunken arteries contrasted with the distended veins but no other abnormalities could be detected in the fundi. Treatment was instituted at once by injections of 0.5 per cent. of neutral strychnin sulphate, with hydro-electric eye baths, using the ascending current, the negative pole at the back of the neck. Purgatives were administered at first and then iron and arsenic, accompanying a nutritious and strengthening diet.

There were no signs of improvement for eight days, but very gradually thereafter the patient became able to distinguish objects placed directly in front of his eyes, between him and the light as their shadows attracted his attention. This condition lasted for a few days longer, after which the vision in the eye first affected notably improved, followed in turn by the other eye. He commenced to count fingers at a meter and by the fifteenth day to read the first letters on Snellen's chart. The chromoscopic disturbances also gradually diminished until he could recognize colors. After a month's stay in the hos-

pital his condition was so much improved that a rapid and complete cure was prophesied. Examination of the fundus of the eye revealed improved nutrition of the optic papillae and a better blood circulation. The papillae of the right eye, the one first affected, still remained a trifle paler than its fellow, but not to any great extent. As the patient was about to be dismissed the right eye grew worse again, requiring a few more days of treatment. As a slight degree of hemeralopia was noticed beef's liver was administered in accordance with Trantas' method, but no benefit was derived, the condition remaining the same. The patient now returned home with vision reduced to 3/10, but even this was considered satisfactory in view of his previous condition. Color perception constantly improved until when he left he responded to the Pettorelli tests (Holmgren modified) without hesitation. He was advised to continue for some time the hyperdermic injection of the neutral sulphate of strychnin and the application of the electric current.

Valenti was unable to find a corresponding case in either general or special literature. There is only one case on record, described by Weiss, which resembles it so far as concerns the visual apparatus. He quotes this case at length, from the *Riforma Medica*, Vol. II, 1897. The patient was a man, 21 years old, who after eating a few spoonfuls of mushrooms (probably the *cantharellus cibarius*), exhibited symptoms of acute gastro-enteritis (as in the majority of cases of mushroom poisoning), accompanied by nausea, eructation, meteorism and vomiting. The interesting ocular manifestations occurred during the period of intoxication. A few hours after the onset of the poisoning and irritation of the digestive organs, the pupils were dilated but in a different degree in each eye (anisocoria), and there was also paresis of the external eye muscles.

This paresis persisted for a few days, but by the eighth day one muscle after the other regained its function. Nystagmus was also noted, the excursions of the eyeball were sluggish and the eyes tired easily in reading. Weiss does not mention the condition of eyesight, and for this reason, Valenti considers his case unique. Although the consequences were not so disastrous as they might have

been, yet the patient's vision was much reduced from the previous normal condition.

Mushroom poisoning in general has many points in common with decomposed meat, but in the latter case no permanent defect of sight has so far been observed. Even transient impairment of vision has never been noted. The mushrooms eaten in the case described, probably belonged to the genus *amanita* (the kind most easily confounded with edible mushrooms) which is responsible for the majority of cases of poisoning on account of the muscarine that it contains. According to statistics, and to the report of Weiss, 90 per cent. of all cases of poisoning are due to this genus. The principal types of this family are the *amanita cesarea* or *cibus deorum*, *amanita muscaria*, *amanita phalloides*, *amanita virosa* and the *amanita pantherina*. All these fungi contain extremely poisonous substances, which can be extracted merely by soaking in water, pure, or, more readily, if combined with an acid. Lebellier isolated a substance very soluble in water, less so in alcohol, oils or ether, which he called *amanitine*. Boudier, later, extracted what he believed to be the active principle, by precipitating it with tannin in an iodid solution. Reveli succeeded in isolating three substances, one volatile, which imparts its peculiar odor to the mushroom; a product soluble in water, which has an action on the heart, and a resinous substance which reduces inflammation, that is found in the juice of the fungus and is soluble in alcohol.

Schmiedeberg and Koppe, finally, completed the analysis, and discovered two alkaloids, muscarine or oxyneurin, and *amanitine*, which they separated by utilizing the physical and chemical properties of their hydrochlorates, or to be more exact, of their auric chlorids. According to the opinion of some, *bulbosine*, also belongs in this category of the poisons in the fungi. However this may be, the agents in mushrooms are among the most powerful vegetable poisons known. They act by destroying the red corpuscles and strange to say, while they stimulate the secretion of the various glands, it arrests the urinary secretion. Returning to his own case Valenti queries, as to the manner in which the optic neuritis (that caused the temporary blindness of his patient) could have been pro-

duced. The fact that no serious alterations were found in the papillas, when the patient entered the hospital, except slight anemia and venous stasis, and these changes persisted only a few days, exclude, he thinks, the existence of an interocular neuritis or papillitis, and suggest rather a retrobulbar neuritis. It is a well known fact, that retrobulbar neuritis may occur, either, in as acute or chronic, is an important factor in its production. Their toxic action recall that of alcohol, nicotin, carbon disulphid, lead, dinitrobenzol, chloral, and chloroform, each of which may induce an intoxication, determining retrobulbar neuritis.

The intoxication in this case, however, was acute, entailing complete blindness in a few hours. The intense headache that accompanied the disturbances and the dull pains in the orbit, increased by the movements of the eyeball, the onset almost simultaneous in both eyes, leave no doubt as to the diagnosis. The muscarine, which had entered the circulation, affected the retrobulbar portion of the optic nerve, causing an acute perineuritis. As the poison was gradually eliminated from the system, the inflammatory process affecting the optic nerve subsided, leaving traces in the nerve fibers. Hence the anemia of the papillas in the eye first affected, and the consequent permanent impairment of vision.

New Operative Method of Tarsorrhaphy.

BOSSALINO (*Annali di Ottalmologie*, XXXI. fasc. 3. 4. 5., p. 195, 1902,) describes tarsorrhaphy as an operation, by means of which the freshened edges of the lids, brought into mutual contact, are soldered together.

It may be partial or total, temporary or permanent. It is partial, when it is employed for the purpose of closing only a portion of the palpebral fissure, and total, when it closes it completely. It is temporary, when the surgeon intends to reopen it sooner or later, permanent, when the causes which made the operation necessary, are irremediable.

The indications for such an operation are various, and it may not be out of place, to briefly enumerate them: 1. In cases of congenital, excessively long, palpebral fissure, to facilitate the closure of the lids for cosmetic purposes.

2. In case of lagophthalmia from paralysis of the facial nerve. 3. In cases of exophthalmus so pronounced, that the lids are unable to conveniently cover and protect the eyeball. 4. In cases of ectropion from cicatricial retraction, especially of the lower lid. 5. As a measure to supplement, nearly every kind of plastic operation on the lids, to prevent excessive cicatricial retraction which might compromise or nullify the success of the intervention.

The first to propose tarsorrhaphy, was Walther, in 1825, and his operation was successively modified by Graefe, Flarer, Arlt, deWecker, Reymond, Fuchs and others. But all the various methods and modifications that have been since devised, present some drawback that are liable to entail consequences, that may induce the operator to regret having undertaken the operation. The methods of Graefe, Arlt, Flarer and Fuchs, are merely slight modifications of the original procedure of Walther, which entails an actual and permanent mutilation, depriving the palpebral space of the eyelashes, which, left in place, would at least conceal the deformity that results from narrowing of the fissure. This mutilation becomes dangerous in case of total, temporary tarsorrhaphy, since, when the time arrives for reopening the fissure, the lids are completely deprived of their lashes, which are not only ornamental, but constitute a most useful portion of the protecting apparatus of the eyeball.

deWecker's method, which leaves the bulbs of the lashes undisturbed, is exempt from this objection but, this operation, fine in theory, in practice presents serious inconveniences. Principal among these is its uncertainty. Frequently the lids are not sufficiently fastened together, or, are only partially in contact, or also the adhesions between them is so incomplete, that the slightest traction on the lids tear them apart. Besides this, we must bear in mind, that the wire sutures frequently tear out at the margins of the lids and leave visible scars.

Reymond's method is ingenious, but useful only in cases in which partial reunion of the edges of the lids is alone required. As the flaps are derived exclusively from the skin of the lids, they leave visible scars. In case of a burn or any other cause of cicatricial ectropion, especial-

ly if the latter be at all extensive, this method cannot be applied.

But tarsorrhaphy to narrow the palpebral fissure is indicated not only in cases of lagophthalmus, and, to restrain a too pronounced exophthalmus; it finds its widest application in plastic operations on the lids, either for the purpose of repairing the loss of substance after ablation of a neoplasm, or to correct some cicatricial ectropion produced by a more or less extensive destruction of the skin of the lids.

In all these cases a complete, temporary closure of the palpebral fissure is required to prevent subsequent cicatricial retraction which might mar the results of the operation. How can we, Bossalino queries, sacrifice the already injured ciliary margin without destroying the principal aim of the operation, i. e., the creation of a new lid that shall resemble the normal lid as closely as possible? For these reasons he believes, that the method of Walther, Graefe, Arlt, Flarer, Fuchs and Reymond, should be absolutely discarded. The only one which allows the retention of the ciliary margin, is that of deWecker. But given the uncertainty of a perfect and solid adherence between the two lids, no operator can be sure of success, if he performs it at the same time as the plastic operation on the lids. The result is liable to be a failure, and compromise the success of the operation proper. It is necessary therefore to perform the tarsorrhaphy first, and only after sufficient time has elapsed to ensure the complete adherence of the lid edges, should we proceed to the second operation, the blepharoplastic. In short, one is compelled in such instances, to perform two different operations, with quite an interval between them. This, in Bossalino's opinion, is quite a serious diadvantage, as the surgeon frequently finds himself compelled, not only to operate well, but, to operate in a relatively restricted time. Besides this, there may be cases of cicatricial ectropion, in which it is impossible to obtain coaptation of the freshened edges of the lids. Confronted with this condition, what is the surgeon to do?

The foregoing are the principal disadvantages presented by the methods of tarsorrhaphy, at present in vogue.

With these premises, Bossalino proceeds to describe the method which he proposes and has successfully applied in three cases, as follows:

A spatula is introduced under the upper lid and an incision is made with the Graefe knife, in the intermarginal space, about 3 mm. deep, commencing at the external angle. It divides the margin of the lid into two layers; the outer contains the intact roots of the lashes and the outlets of the Meibomian glands. The size of the incision should be proportional to the desired amount of closure of the palpebral fissure. The same procedure is repeated on the lower lid. After this has been done, a silk suture, with a needle on each end, is passed through the edge of the inner layer of the lower lid, so that the thread emerges on the conjunctival surface. The needles are then introduced in turn between the two sheets of the upper lid, parallel and vertical to their first insertion in the lower lid, and, passing between the tarsus and the skin, emerge above, about 2 cm. from the margin of the upper lid. Traction on the two ends of the thread draws up the inner layer of the lower lid into the intermarginal incision in the upper lid. One, two or three of these stitches can be taken according as the tarsorrhaphy is to be partial or total.

These are the general outlines of the operation. The operator can modify it according to the indications in each individual case. For example, if it is to be associated with a plastic operation on the upper lid, then the procedure should be reserved and the stitches taken first in the inner layer of the upper lid, which is then drawn down until it fits into the intermarginal incision in the lower lid. In any event, it is advisable to inspect and see whether the other margins of the lids are in exact coaptation, without over-riding, before applying a (light compress) bandage. Cicatrization proceeds with surprising rapidity. In a few days the lids are firmly soldered together without a trace of a cicatrix on the skin as the latter was not incised in anyway. Bossalino describes the three cases in which he applied this intervention and which have confirmed its utility.

His first patient was a lad of 14, who entered the clinic, July 2, 1902. A few months previously he had been af-

fectured with a carbuncle on the upper lid of the left eye which had been cauterized with a hot iron. The upper lid had been completely destroyed, except its conjunctiva, which was everted and retracted and attached to a scrap of cicatricial tissue in the upper portion of the orbit a segment of the globe being thus completely exposed. No motion to close or open the lids was noted, except a slight movement of the remnant of the upper lid when the patient looked upward. This suggested that the orbicularis must have been destroyed while the levator was intact. The cornea had already commenced to show signs of infiltration. The operation was undertaken July 27. The conjunctivae of the upper lid was detached from its adhesions and drawn down. An incision about 3 mm. deep was then made in the intermarginal space of the lower lid for its entire length. This divided, as before suggested, the margin of the lid into two layers, with the ciliary follicles and the outlets of the Meibomian glands in the outer layer. A silk thread with a needle on both ends was then passed through the conjunctivae of the upper lid, forming a horizontal loop on the outside. The needles were then carried down through the incision in the lid, passing between the tarsus and the skin, and brought out through the lid, at parallel points, about 2 cm. from the margin of the lid. Three of these stitches were inserted. After the threads had been tied and the palpebral fissure thus completely obliterated, Bossalino proceeded to perform a plastic operation on the upper lid after Fricke's method. The flap was taken for the purpose from the frontal region and sutured to the conjunctiva in such a manner as to completely repair the defect, after which the light pressure bandage was applied. Recovery was rapid and the patient was dismissed the sixteenth day with the eye still closed. He returned September 24, and the fissure was partially opened. November 10, the interpalpebral fissure was definitely re-established. The conjunctiva was adherent to and formed a perfect lining to the new upper lid. The eyeball was in good condition and the eyelids could be opened and closed, although their movements were somewhat restricted.

The second patient, a man of 58, entered the clinic on account of lagophthalmia, from complete paralysis of the

right facial nerve. An incipient, neuroparalitic keratitis was manifest in the lower half of the cornea. All attempts at treatment of the paralysis had been ineffectual and tarsorrhaphy was indicated to gain time and protect the globe from further lesions. As partial closure of palpebral fissure was sufficient for this case, the intermarginal incisions, while 3 mm. deep, extended only half the length of the margin of the lids. The inner layer of the lower lid was drawn up into the intermarginal incision in the upper lid. A single loop stitch answered the purpose. The thread was removed the sixth day as the union of the lids was already accomplished. The patient was dismissed cured the tenth day. The lids have retained their lashes intact, and the fissure has been narrowed to exactly the point desired.

The third patient was a man of 76, who presented an epithelioma involving two-thirds of the lower lid, but with the ciliary margin intact. The operation included ablation of the tumor, tarsorrhaphy and blepharoplasty at one sitting. The two lids were slit as above described, a single loop stitch was taken through the center of the posterior layer of the lower lid and the latter was drawn up into a corresponding intermarginal incision in the upper lid. The parallel ends of the thread emerged through the skin of the upper lid, about 2 cm. from the edge and were tied over a bead. The tumor was then excised according to Dieffenbach's method, the incision forming an isosceles triangle with the base toward the palpebral fissure. The base line of the triangle about 4 mm. from the margin of the lid, was then carried to right and left after the tumor had been removed, and skin flaps were detached and drawn up over the defect, sutured and a bandage applied. Cicatrization was rapid and the patient was dismissed quite recovered on the fifteenth day. This plastic operation was very successful as no visible scar resulted. The tarsorrhaphy was entirely satisfactory. The coaptation of the lids was perfect and exactly at the point where it was needed. The patient returned afterward, as directed, for the final reopening of the fissure.

Bossalino is convinced that his three cases definitely establish the great value of this method of tarsorrhaphy and its superiority to the others practiced to date. In the

first case it not only ensured the closure of the lids, but it enabled the conjunctiva to be spread out in the best condition for adhesion to the newly made lid, thus avoiding the inconveniences of a lid without a conjunctival lining, and this was accomplished without the slightest interference with the closure of the fissure. The rapidity of the union is also demonstrated in the other cases. In one the lids were solidly fastened together in six days, and in the other, although the operation was comparatively extensive, recovery was complete in fifteen days. Last, but not least, there was no mutilation in any instance; the lids retained their ciliary margins intact as if no operation had been performed. For all these reasons he considers himself justified in the following conclusions: 1. That the method of tarsorrhaphy which he proposes does not produce any mutilation of any part of the lids and yet allows the preservation intact of the ciliary margin with its natural fringe of lashes. 2. That it is equally applicable for partial and total tarsorrhaphy. 3. That it does not cause a visible scar. 4. That the successful results are so rapid and so certain that the use of a wire, such as is required in certain operations and for quite a long time in some cases, is rendered superfluous. Silk is all that is necessary, and three stitches are sufficient, as the lids become firmly united in a few days. 5. The operation can easily be performed at the same time as any blepharoplasty lids, thus saving the patient a second operation

ABSTRACTS FROM AUSTRO-HUNGARIAN OPHTHALMIC LITERATURE.

BY

J. GUTTMANN, M. D.

NEW YORK.

(Quarter ending March 31, 1902.)

Several Months Experience in Egypt with a Specific Remedy for Inflammatory Affections of the Eye, Especially for Trachoma.

DONATH, JULIUS, DR. (*Medicinisch Chirurgisches Centralblatt*, Feb. 13, 1903.) The author after citing different opinions about the mode of treating trachoma comes to the conclusion, that Ophthalmol Lindemann is the best remedy for trachoma and other inflammatory affections of the eye. He has seen it used in Egypt, for several months, in trachoma and blenorrhea.

The drug is a natural oily product, carefully sterilized; chemically analyzed it shows the presence of iodine and traces of acid (arachin acid).

Instilled into the eye several times daily, it is borne quite well and may be used indefinitely. In the healthy eye it produces a slightly itchy burning, redness of the conjunctiva, lachrimation, slight blepharospasm and photophobia; these symptoms disappear in a few minutes, thus acting as a slight irritant. Animals whose conjunctiva and cornea were burned with chalk and corrosive sublimate were promptly cured by ophthalmol.

In acute inflammatory affections of the eye with photophobia, painful blepharospasm and tearing, the drug is very efficacious. Almost immediately after the installation the blepharospasm, photophobia and lachrimation cease, the redness and swelling of the conjunctiva diminish and in a few days there is a perfect cure.

In secretory processes, at first, the secretion increases, but later diminishes very rapidly; at the same time the

swelling of the lids and chemosis of the conjunctiva bulbi decreases and the progress of the affection upon the cornea is stopped.

The severest forms of ulcers of the cornea heal in a very short time by the formation of new blood-vessels with regeneration of corneal tissue, and corneal scars become transparent after the use of the drug.

In chronic inflammations of the eye, especially in old trachoma with diffuse infiltration and hypertrophy of the conjunctiva opthalmol at first increases the inflammatory symptoms in the conjunctiva, but after this reaction the swelling subsides.

The curative effect of opthalmol is seen also in pannus. Recent slight pannus is cured very promptly; the older forms of pannus (*crassus* and *siccus*), with ulcer of the cornea, show at first an increased succulence, and new formation of blood-vessels, with consequent resorption and clearing up.

The author compares opthalmol with nitrate of silver, and copper sulphate, and shows its advantage over the latter two drugs in the fact that it is neither painful nor dangerous. There is no contraindication to the use of the drug. It favors resorption, increases the vitality of the tissues, acts antiseptically by the lachrimation it produces, and by its oily consistence acts mechanically as a protective and covering.

Jequiritol and Jequiritol Serum with Special References to the Treatment of Pannus Trachomatosus.

KARL HOOR, DR. (*Pester Medicinische Chirurgische Presse*, Feb. 22, 1903.) After a lengthy description of jequiritol, its applications, and the clinical experiences, which the author and others have had with this drug in different affections of the eye, he concludes as follows: Jequiritol is a remedy whose specific action is on the cornea; it has no effect upon diseases of the conjunctiva; in purulent affections of the cornea its use is absolutely prohibited; it is indicated in old cases of pannus trachomatosus, whether these are rich or poor in blood-vessels; it is also indicated in pannus eczematosus, in opacities of the cornea, after protracted inflammation, which could not be

cleared up by other remedies. Both eyes, however, should never be treated at the same time.

There is no doubt, that the effects of jequiritol can be fairly well determined, but there are individual variations in the susceptibility of the drug. Its use is not entirely without danger; severe ulcerations of the cornea, and affections of the lachrimal apparatus have been observed. The severer the jequiritol ophthalmia is, the more difficult will it be to produce another one. This immunity may last for four weeks.

The jequiritol serum prevents and moderates the subjective symptoms of jequiritol ophthalmia, but it is questionable, whether it has any beneficial effect upon the objective symptoms. The serum seems to have no effect upon the cure of the ulcer produced by the jequiritol ophthalmia. The author doubts whether it can cure or even prevent the inflammation of the lachrimal sac.

Great care must be taken as regards the severity of the artificially produced inflammation as the effect of the serum is not absolutely certain. If the above mentioned indications and cautions are well borne in mind jequiritol will prove a very valuable remedy. Its advantage over the infusum jequirity is its exact dosage.

Contusion of the Eyeball with Special Reference to the Consequent Defect of the Iris and Lens.

FEJER, J., DR. (*Pester Medicinische Chirurgische Presse*, Feb. 22, 1903.) After a thorough review of the current literature on the subject, the writer describes his case. The patient, 48 years old, fell and struck his right eye against the edge of a chair; he immediately became blind. The eye was full of blood, but eight days later the author could diagnosticate that the iris was missing. No trace of an injury to the sclera could be seen. In the course of time the blood became resorbed, vision was with 14 D=5.40; the interior of the eye appeared normal, only in the vitreous a shrunken little body—the remains of the lens—could be observed. The iris was entirely absent. The detachment of the iris without an injury to the sclera is of very rare occurrence. In this case the lens also became absorbed.

This case illustrates very clearly the resistance of the sclera and the great absorptive power of the eye-bulb.

Tuberculosis' of the Iris.

GROSZ, EMIL, PROF. (*Pester Medicinisch Chirurgische Presse*, Feb. 6, 1903.) From statistical complications it appears that in ten thousand affections of the eye there occur one or two cases of tuberculous iritis. In old literature the affection was looked upon as a gumma, or tumor of the iris and Gradenigo in 1870 was the first one to describe this disease, after he showed that a patient suffering from an iritis with a small tumor of the iris succumbed to miliary tuberculosis.

Tuberculous iritis manifests itself usually in young people; it is a chronic painless affection in which an iritis is always present, and at the root of the iris is developed a yellowish gray tumor, which later assumes a reddish color. On the posterior surface of the cornea there appear small precipitates, triangular in form; the margin of the pupil adheres in several places to the anterior surface of the lens.

With the increasing growth of the tumor, the visual power is correspondingly diminished; the tumor then occupies the entire anterior chamber, and perforates the bulbus usually in the region of the limbus, a few months later the eye shows the picture of phthisis bulbi. This tumor can easily be distinguished from a gumma, as the latter is situated on the pupillary margin. A sarcomatous tumor is not accompanied with the formation of precipitates, nor with adhesions to the pupillary margin. The author then describes a case of tuberculous iritis in a girl 11 years old in whom the eye was enucleated, and the diagnosis confirmed. He then cites a case of miliary tuberculosis of the iris of a milder form than the one described. This affection also is most common in the young, the power of vision diminished gradually with slight symptoms of irritation. The objective examination shows a slight ciliary injection and small yellowish, gray granules on the surface of the dull iris. Precipitates and posterior synechiae also accompany this form. In the course of a few months these precipitates may disappear entirely, and atrophic spots remain in their place; the power of vision improves somewhat, but it never becomes normal. In other cases, and these are the more frequent ones, the symptoms of chronic iritis are more pronounced, the pupil

becomes totally occluded by the synechiae, a secondary glaucoma is developed, and the bulbus becomes atrophied.

The author is of the opinion, that in cases of solitary tubercle of the iris, if the vision is lost, the eye should be enucleated, inasmuch as these cases terminate badly anyhow. If we believe that tuberculosis of the iris can be a primary affection, then enucleation of the eye can be considered a life saving operation; as by this, the general tuberculous affection of the organism can be avoided; enucleation is indicated even if the affection of the eye is secondary, because by this operation, the patient is saved the pain accompanying the breaking of the tumor through the eyeball. The writer is not in favor of excision of the affected part of the iris.

In miliary or disseminated forms of tuberculous iris, he is inclined to a more conservative mode of treatment. General roborantiae, fresh air and good nourishment can greatly improve the condition of the eye. Extirpation of the iris which is covered with these small granules, is absolutely of no avail. Surgical interference is indicated only by the secondary symptoms, oclusio or seclusio pupillae or atrophy of the eyebulb.

A Case of Uremic Amaurosis.

HAEMENSCHILD, W., DR. (*Medicinisch Chirurgisches Centralblatt*, Feb. 27, 1903.) Nephritis is very frequently complicated by affections of the eye, which are of great interest to the ophthalmologist. These changes in the interior of the eye can be seen objectively by the ophthalmoscope, but there are some affections of the eye in this disease, that cannot be detected by that instrument, especially uremic amaurosis.

The author then cites a fatal case of nephritis, where after a severe attack of uremia, total blindness of both eyes occurred for 18 hours, after which sight was regained. During these 18 hours the patient had no headache, dizziness, nausea or vomiting. The reaction of the pupils was normal, showing that there was no pathological changes in the optic nerve. It is of interest to note that in this case the amount of urine was not diminished during the attack of uremia and amaurosis, nor was the amount of albumen increased.

Uremic amaurosis is to be differentiated mainly from retinitis albuminosa, retrobulbar neuritis amaurosis from great loss of blood and from hysterical blindness.

The author could not find any satisfactory explanation of the pathology of the affection. He doubts whether we have to deal here with a temporary edema of the retina, optic nerve or its sheath, because ophthalmoscopic examination during one of these attacks shows absolutely no change in the interior of the eye. He is more inclined to ascribe the cause of this condition to changes in the brain.

Inasmuch as the pupillary reaction was normal, it is to be inferred that the fibres of the optic nerve were intact as far as the corpora quadrigemina. The conductivity of the nerve was probably interrupted somewhere posterior to these ganglia, so that the seat of affection was most likely in the calcarine fissure of the occipital lobe. The causation of the amaurosis is probably identical with that of uremic convulsion. The author then cites three theories as to the cause of uremic convulsions; that of Traube, Frerichs and Jakch.

ABSTRACTS FROM JAPANESE OPHTHALMIC LITERATURE.

BY

DR. MITSUYASU INOUE.

TOKIO, JAPAN.

TRANSLATED FROM GERMAN MS. BY H. V. WÜRDEMAN, M. D.,

MILWAUKEE, WIS.

(Quarter ending Dec. 31, 1902.)

Keratitis—Interstitialis Punctata Specifica.

A 26-year old man had for several days remarked loss of vision in the right eye. Examination by daylight showed three delicate spots in the center of the cornea with the loop, there could be seen countless minute areas of opacity with clear spots between, deep in the substantia propria of the cornea. The opacities extended through about two-thirds of the cornea's depth, occupying the deeper layers. Iris normal. No inflammatory symptoms of the eyeball. V about 6/XL; aside from a well defined cicatrix of the angle of the mouth and periositis of the right tibia, which are well known symptoms of hereditary syphilis, nothing else abnormal was found. The spots were resorbed in about a month, with the exception of two in the center which become larger. In another one-half month two opacities began in the left cornea and in a week the case presented an appearance of typical double circumscribed avascular interstitial keratitis. The author deems the characteristics of keratitis—interstitialis punctata specifica—to be the entire absence of the inflammatory symptoms; the relative quick resorption; the relatively slight diminution of visual acuity, etc., and thinks that the Mauthner's theory of gummatous cells of infiltration and the lymph coagulation theory of Vammon both incorrect and advances an hypothesis that the wandering

cells in slight or very chronic inflammatory cases fill the lymph spaces of the cornea and that they do not enter the lamella and hence produce the appearance of typical punctata spots with clear inter-spaces.

Ptosis Operation.

KOMOTO, PROF. For six years the author has practiced a new operation for ptosis. In this two incisions are made parallel with the free margin of the upper lids and brought together at each end, forming an oblong flap 5 mm. in length. This flap is then divided in the center and loosened in the medial and lateral direction. The under-side of each flap is then separated to the central part. Two needles with sutures attached are then passed through the ends of each flap. The neighboring skin is then undermined above to the eyebrow and downward to the lid margin. One of the flaps is then turned 90° so that one end of the suture is passed under the skin through the eyebrow and the other end the lid margin and then tied together. The same procedure is then repeated with the other flap, two perpendicular skin strips are thus formed under the skin of the lid which should diverge somewhat above. The end of the sutures at the lid margin are turned up to the forehead after being tied and fixed over the eyebrow by adhesive plaster. These stitches are removed in one week. The more the skin strips shrink from operation, the greater will be the effect of operation.

Rodent Ulcer of the Cornea.

ASAYMA, PROF. This disease is relatively common in Japan. The author having observed within two years four such cases out of 6,780 eye patients. Although the disease originally pursues a very chronic course, may also cause blindness within a few weeks, which is illustrated by the following case. A sixty-two year old man began with ulcer January 3d in the right cornea, and on the next day the left became affected. On the 13th the entire anterior layer of the left cornea was destroyed and the right was almost as severe. In such cases the cicatrices, following the healing of the ulcer may become transparent so that some sight may be restored. This happened in one case, who could only see movements of hands close to

him and who, on returning to the clinic had vision of 6/36 and 6/60. This case shows us that such a blind eye should not be hastily enucleated, as improvement of vision sometimes occurs. No treatment of all the forms recommended by many authors is sure to heal or to restore the working powers. On account pain, Dr. Asayma enucleated the eye of the 48-year-old man who had circular ulcer of the cornea, of which the center was opaque, hypopian was present the histologic examination gave the following result: In the region of the ulcer the thickness of the cornea was only 0.2 to 0.4 mm., which is only 1-3 to 1-5 of its normal thickness.

On account of inhibition of fluid the overlying anterior layers of the center of the cornea was swollen and containing slightly colored fixed cells, but no increase of neuclear. The epithelium of this part was entirely destroyed, but Bowman's membrane remained intact. The periphery was more or less undermined, the epithelium at the newer portion of the ulcer was freshly destroyed and shows occasional round cell infiltration. The balance was covered here and there with deeply penetrating regenerated epithelium. Between these and the posterior healthy layer, was a newly developed membrane full of blood vessels. At the central portion of the cornea the round cells become numerous with this membrane. On the proterior surface of Descemet's membrane, precipitates composed of pigment cells are found, the hypopian was composed of round cells and pigment neucli. The iris was entirely infiltrated by round cells and there were two lumps on the pupillary edge, which were composed of well colored round cells, massed together. Behind these were posterior synechiae and pupillary membrane. The ciliary body was infiltrated by cells, but not to such an extent as the iris. These findings show that the opacities of the anterior layers of the center of the cornea were not due to round cell infiltration but to necrosis and inhibition of fluid resulting from inhibition of nutrition as a result of the ring ulcer causing the loss of epithelium from necrosis. It is possible then that Dufour saw in this disease a local eye process under the corneal epithelium, which seems to be in the beginning no progressive underlying process can be discovered at the edge of the ulcer, forming gutter-like

ulcer and of course can not be diagnosed under the microscope as a local process. Ahlström thinks that the anaesthesia of the cornea is the cause of *ulcus rodens*, but his hypothesis can not be considered as Schmidt-Rimpler and Hilleman deposed it. They found thrombosis in the vessels of the episcleral tissues and from that destruction of the arterial twigs to cause the corneal necrosis. No such findings were found in the preparations made by Asyoma. None of the many authors have found any specific micro-organism. Asyoma thinks that the infection must arise from general diseases, as no local causes have been shown often affecting both eyes. The fact that the patient generally appears anemic speaks for it. It is certain that the process is nothing else than a necrosis of the membranes, caused by the toxins which are produced by micro-organisms in general blood disease and under micro-organisms on the eye which produce a necrotic effect upon the circular nutrient-pericorneal blood vessels. The question is, "what is the general disease which gives out the toxemia?" In three out of the four cases observed by the author many anchylostomata were found in the stools. On account of the commonness of anchylostomala disease in Japan this cannot be accepted as the cause without further investigation, but theoretically and etiologically connection between the two affections is plausible.

The Artificial Eye for Teaching Refraction.

ANDO, S., DR. The apparatus consists of the inner and outer cylinders, one of which has three holes of different sizes, corresponding to the pupil and the other contains convex lenses of 1.00, 2.00, 3.00 D, which may, by turning the disc be brought behind the pupillary openings by pushing the inner cylinder in and out and turning the lens carrying discs of varying refraction, between H. 14, O D, and M. 15, O D, may be made, and astigmatic effect may be made by putting in cylindrical glass. Further description can not be given without illustration.

More Concerning the Occurrence of *Filaria* in the Human Vitreous.

NAKAIZOMI, Y., DR. The patient with the *filaria* in the corpus vitreum, which N. had reported (see abstracts in

these ANNALS for 1902) came to the University Hospital in April, 1902, with symptoms of cancer of the stomach. The traces of the dead worm in the vitreum, the fundus and the media remain similar and the vision was the same as at the time he was discharged from the eye clinic. The patient died June 6th from marasmus.

Dr. Mizuo reported (see abstract July, 1902) that retinitis cachexia appeared before both. Nakaizomi acquired the right eye, which contained the worm and reports the following: Vitreous somewhat fluid: the filaria lay on the lower, outer branches of the retinal veins. No gross changes were found in the vitreous or the retina in the neighborhood of the worm, except areas in the retina which could be ascribed by the cachectic processes. The animal was difficult to remove as it was attached to the retina. The contents of the blood vessels showed nothing abnormal. The parasite itself is milkwhite, translucent and thread-like, one end seemed thin and the other rounded; the worm's length is 7.5 mm; the thickness of the head 0.17 mm. the tail end 0.09 mm. and the middle portion 0.22 mm. Prof. Tisima, the zoologist, examined the worm and gave the following opinion: Although a long time elapsing since the death of the parasite (over 600 days) has rendered its structures indistinct, there is no doubt but that it is a "filaria," whether or not it is a "loa" or another form is difficult to say. The observations show that a filaria in the vitreous does not always cause opacities or lead to inflammation of the retina and optic nerve.

A Case of the So-Called Sympathetic Retino-Chorioiditis.

KOMOTO, J., PROF. A 13-year old girl cut the lower temporal portion of the right cornea with the point of a bare scissors. The eye rapidly became blind with pain, lacrimation, photophobia, injection and other symptoms. An operation was done five weeks after this unhappy event, but without result as the left acquired photophobia epiphora with loss of vision. The patient did not consult the author until three months after the accident; when the entire eye was in a condition of phthisis bulbi, without inflammation. The linear scar, 3-4 mm. could be seen in the cornea, but did not include the sclera, to which the

entire pupillary edge was attached. The left eye showed precipitate on the posterior surfaces of the cornea and the pigment spots on the anterior lens capsule externally nothing else abnormally. The pupillary reaction was slow and not well dilated by atropine. On account of fine deposits in the vitreous a good ophthalmoscopic examination could not be made. The visual field was normal and the visual acuity 20/100. Atropine was instilled and iodide of potash and salicylate of mercury administered, by which treatment the vision of the left eye was much improved and the deposit on cornea and in the vitreous became more or less resorbed; soon the fundus could be seen. Unexpectedly yellowish white pigments shot like areas were discovered in the periphery. The papilla was redened, thickened and swollen. The retina was likewise somewhat clouded. As vision diminished the number of shot like areas became greater. These areas were mostly small, the largest being one-third of the diameter of the papilla. Some of them became confluent. There were a number of areas with ill defined edges, which first appeared and then disappeared. The retinal vessels were included in some of the areas. On account of the absence of pigmentation and disappearance of the areas on the subsidence inflammatory symptoms, the author thinks this was not a retinal chorioiditis alone, but an exudate into the vitreal lamella following the inflammation.

India Ink (in Tattooing of the Cornea).

MISHIMA, H., DR. As it has been lately discovered by Hamilton that the capsule bacillus exists in India ink that this microorganism is supposed to be responsible for supuration of the cornea following tattooing the oculists have been warned against using the same. The author has examined three sorts of Chinese ink, and two sorts, one of the best make and one of the poorer makes of Japanese ink; ordinarily no micro-organisms are found on severed glass examination. M. then tried cultured experiments by the ink rubbed up with sterile water and developed several sorts of microbes; as this finding was open to suspicion that during the rubbing up of the ink the micro-organism had gotten in through the atmosphere

he again tried cultures made with India ink powder with negative results. He also demonstrated that in rubbing up ink under disinfected tissue no organisms were found, as the preparation was then protected from the air. He then tried making the ink with 500 sub. solution and found no colonies of micro-organisms. Therefore he concludes that a practical application of these findings should be that the tattooing fluid should be made with sublimate. The question arises, why should ink be sterile and then he found that introduction of the India ink into solution, several kinds of culture media showed the development of micro-organisms.

His resumé shows that ordinarily all kinds of Chinese or Japanese ink of the better or cheaper sorts are sterile. The micro-organisms found by the various authors in ink come from the air and get in during the rubbing in of the ink. Before using the solution, the vessel should be disinfected by rubbing it, for instance, with 90 per cent. alcohol for about fifteen minutes.

The Mydriatic Effect of Adrenalin (Cocaine).

TAKENOUSTI, I., DR. In a number of operations the authors injected one-fourth to two-thirds hypodermic syringe full of 1 to 5000 adrenolin chloride and 3 per cent. cocaine solutions under the conjunctiva and found that the pupil dilated to the maximum mostly on the side near the injection. We have not found that adrenalin has any effect upon the pupil. (Cocaine, however, is well known to act as a mydriatic.)

ABSTRACTS FROM SPANISH AND PORTUGUESE
OPHTHALMIC LITERATURE.

BY

ALBERT B. HALE, M. D.,

CHICAGO, ILL.

(Quarter Ending March 31, 1902.)

Fracture of the Cranium with Ocular Complications.

DEMCHERI-MONTEVIDEO (*Archivos de Oftalmologia*, January, 1908), observed a case of a fall from a horse ten days previously. There seems to have been no absolute loss of consciousness at the moment. The injury was in the right frontal region and some loss of brain tissue was suspected. Vision was diminished and there was noticeable miosis in the right eye. On technical examination, vision OD was reduced to finger counting at 2.50 m., o. s. normal. Pupils normal, reaction o. d. lost to light, but well retained consensually. V. F. somewhat hemianopic OD. Same diplopia pointing to paralysis of recti superior and internal. Some papillitis OD. Corneal sensibility OD, very diminished; this anesthesia embraced ophthalmic branch and the superior maxillary branch of the trigeminus. There was also right anosomia. The papillitis soon faded and the patient claimed to see better. Six months later VOD was 1-6 and VF increased but papilla pale. This condition continued for three years unchanged.

Demicheri asks what value had the ophthalmoscopic examination "and can the changes in the nerve be used to aid the diagnosis of an initial traumatic meningo-encephalitis? The left eye was only partly affected. The right eye showed a *staungspapilli* and signs indicating compression of the nerve head near optic canal. He cites other cases of similar signs where a hemorrhage within the optic nerve sheath was the sole cause of the papillitis, but here the left eye showed signs which should locate the

lesion outside the sheath, and the author is therefore inclined to locate the injury within the cranium (a meningeal hemorrhage). He reports the case in encouragement to those who look too gloomily upon fractures of the cranial bones.

Asthenopia Produced by Frowning (Lids).

BULL, GEORGE J., of Paris (*Archives de Optalmologia*, January, 1903), has an interesting article on this subject, which, as I fear, it has appeared elsewhere. I abstract in very few words. He refers to the muscular asthenopia of Donders, and as to accommodative asthenopia. This asthenopia of Bull is the result of contraction of the *lids*, and has well recognized symptoms, differing from those of the beforementioned asthenopias. Bull has noticed that in using the ophthalmometer with the right eye, he saw with the left eye the horizontal lines double. (He has the habit of forcibly shutting the left lids). This symptom was in 1889 described by Leroy as *paliopia asymmetrica*, and ascribed to the lens. Bull ascribes the phenomenon to the cornea which is pressed upon "like a rubber band" by the lids. He gives various illustrations to show the influence on the corneal image of this lid pressure and its effect on the retinal image. As the eyes during sleep are so rolled upward that the cornea is not exposed to the pressure of the lids, no effect is then produced. He finishes with an example of a painter who had the bad habit of shutting one eye while working, there was no refractive asthenopia nor heterophoria, and correction of the habit removed the symptoms of which he complained.

Foreign Bodies in the Iris.

VIÇIANO, Valencia, reports (*Archives de Oftalmologia*, Jan., 1903) the case of a girl of eight, into whose eye a piece of metal had been shot. It penetrated the cornea and lodged in the iris near the ciliary attachment. The cornea cicatrized normally leaving the iris irritated, but not to the extent of an inflammation. There was no pain nor disturbance of vision. But within a few days iritis and hypopyon supervened. The foreign body was then removed and the eye soon after became quiet. The reporter warns against any delay in such cases.

Trachoma in Cairo.

CAMPOS, Paris, publishes clinical notes (*Archives de Ophthalmologia*, Feb., 1903) on a lengthy stay he has just made in Cairo, Egypt. He analyzes the theory of the contagionists and agrees with them that Egypt is not the place to prove the contagiousness of trachoma. Switzerland shows that probably contagion plays an important part in the spread of the disease. "No conjunctivitis, no granulation" is an important dictum. Purulent secretion is the best mixture had for trachoma. Campos would add to this a necessity of profuse lacrimation. Another point is that in Cairo many children (infants) are affected, while elsewhere the disease seems to show itself chiefly in young adults. Again trachoma is essentially a chronic disease—there is no abundance secretion such as is characteristic of an acute conjunctivitis. Campos is a dualist, recognizing trachoma and papillary catarrh as distinct diseases, but he thinks the distinction often a difficult one to make.

The prognosis varies in cases. Trachoma may heal spontaneously or may be cured by simple means, or is incurable. The only trustworthy remedy is sulfate of copper, used properly, though of course other drugs may encourage this treatment. When the trachoma shows abundant secretion, nitrate of silver (2 per cent.) may be used—never the stick. In non-secreting exuberant granulations, massage to the point of hemorrhage with boric acid is of help, a yellow mercurial salve and the copper stick; when the conjunctiva is velvety with pale and modest papillae, the sulfate of copper in 1.10 solution in glycerine is best. In extreme cases excision of the retrotarsal folds is permissible.

Paralysis of Superior Oblique Due to Trepanning of Frontal Sinus.

QUINTELA, Montevideo, wishes to add to the two cases of this condition observed by Stanculeana in the January, 1902, number of the *Archives d'Ophthalmologie*, two cases of his own (*Anales de Ophthalmologia*, Dec., 1902). Case I. Sinusitis fronto-ethmoido-maxilaris dextra. Woman 33. Pus found after trepanning by Luc's method. Some days after operation patient complained of seeing double. This was at first thought to be due to post operative edema, but as

diplopia continued permanently, it was ascribed to sanguineous infiltration of the muscle itself. Case II. Sinusitis-fronto-ethmoido maxillaris sinistra. Male 30. Trepanning by Luc's method. Pus found. Shortly after, patient complained of seeing double, the diplopia being traced to paralysis of the superior oblique, due undoubtedly to trauma, while resecting anterior or inferior wells of the frontal sinus.

Zona Ophthalmica with Paralysis of the Third Nerve.

MENACHO, Barcelona, reports (*Anales de Oftalmologia*, Jan., 1903) a unique case of this condition in a teacher, who for ten days had exquisite pain on the left side of the head (forehead.) Thereafter there developed a vesicopustular eruption in the frontal, temporal, frontal and nasal regions, in the superior and inferior lids, accompanying which was a nearly absolutely insensibility. Twelve days after the eruption there was noticed a ptosis of the upper lid and a dilatation of the pupil without loss of visual acuity. Patient was myopic 8D. and of good healthy history (but he died later of tubercular laryngitis). There was an array of poor teeth. The noteworthy condition was the zona associated with paralysis, which supports the anatomical fact of an anastomosis between the third and fifth cranial nerves at the external wall of the cavernous sinus. The pathology was doubtless a neuritis of the ophthalmic branch (of Willis). The cause might be local, due to a decayed tooth, or more general, due to tuberculosis, manifesting itself in the nerve.

Paralysis of the Fourth Cranial Nerve on Both Sides, Due to Trauma.

DEMICHERI, Montevideo, thinks (*Anales de Oftalmologia*, Feb., 1903), this is the only case on record of traumatic paralysis of the two superior obliques. A boy of 21 fell from the roof of a house, producing a fracture of the radius and a fissured fracture of the left superior maxillary with a contused wound of the eyebrow and hematoma of the lid on the same side. There were no classic symptoms of fracture of the base. Loss of consciousness lasted three days, after which recovery was complete except for a diplopia which drove the patient to the oculist.

The eyes were normal, vision each eye normal. Most movements were normal, but on looking downward the eyes were inactive; on looking downward and to the right and left the movements were abnormal. In fact, the classical picture of isolated paralysis of the superior oblique—but of each eye—was demonstrable (according to Mauthner's scheme). The patient was very intelligent and followed the examination with the greatest interest and help. In addition to Mauthner's signs it was noticed that the images were inclined toward each other.

The location of the lesion is given by Demicheri, not in the base, as that seems to him impossible, as a nuclear one, in the fourth ventricle or rather in the valve of Vieussens, where the nuclei of the two nerves are very close together. A small hemorrhage in the place could well cause the condition here given.

Dacrioadenocèle Traumática.

RAMAS, Mexico (*Anales de Oftalmología*, February, 1903), reports the following accident: A boy 3 1-2 years old, who had a year ago suffered from acute poliomyelitis fell and cut himself severely on the right side of the forehead. Hemorrhage was severe from a wound three centimeters long just below the supraorbital ridge. Through the wound was seen a yellow lobular mass, but the eyeball had escaped. On chloroforming the child this mass was found to be glandular in structure with several lobes, and with fringe beneath the conjunctiva (within the orbit) the space occupied by the lacrimal gland was found to be absent. The diagnosis of traumatic displacement of the lacrimal gland was then made, and with care the gland was replaced and the strictures above it so sutured as to leave the relationships as normal as possible. No reaction followed and at the end of a week the patient was discharged cured, with glandular action seemingly as perfect as ever.

Corneal Infiltration in the Course of Exuberant Pericorneal Conjunctivitis.

GONZALEZ, LEON, Mexico extends the study of *Spring Catarrh* (*Anales de Oftalmología*, March 1903), by calling attention to the condition of the cornea noticed only by Fuchs where there are infiltrates in addition to the peri-

corneal injection. This is an infrequent complication, occurring almost in one-eighth of the cases. It resembles a xerontoxon in being separated from the corneal edge by a clear zone of healthy cornea, but there is usually an increased vascularization at the limbus, but this infiltrate has a tendency to spread and may lose its epithelial covering and change to an ulcer. It runs *pari passu* with the limbitis (spring catarrh) and can disappear leaving a normal cornea with perhaps a slight nebula. In clinical aspect he says: 1. These corneal lesions arise superficially with intact epithelium. 2. The migration of cells being the chief cause of pericorneal inflammation, the same process is at the bottom of the keratitis.

OPHTHALMIC NEWS, ITEMS AND ANOUNCEMENTS.

(Under this heading the ANNALS will publish items of interest. Please address Dr. B. E. Freyer, 520 E. Ninth Street, Kansas City, Mo.)

Dr. Karl Stellwag von Carion, celebrated his eightieth birthday, January 28.

Dr. Adolf Szili, professor in the University at Budapest, has been made a nobleman.

Dr. E. Emmert has been appointed Professor of Ophthalmology in the University of Berne.

Dr. Natio, has succeeded to the hospital surgency made vacant by the death of Dr. T. Inouye, at Tokio.

Prof. Uhthoff will visit New York, Philadelphia, Washington, Chicago and other of our medical centers.

Dr. Chas. H. May has resigned position as chief of clinic at the college of Physician and Surgeons, New York City.

Dr. Albert B. Hale, one of the editorial staff of the ANNALS, has been elected a member of the Mexican Ophthalmological Society.

Dr. James Bankart, one of the surgeons at the West of England Eye Infirmary, died at Exeter, October 31. He was 68 years of age.

Dr. Arnold H. Knapp has been appointed Professor of ophthalmology to the College of Physicians and Surgeons, New York City.

Dr. Casey A. Wood was given the degree of Doctor of Civil Law by his Alma Mater, the University of Bishops College, Montreal.

Kansas.—Bill to Govern Oculists.—A bill has been introduced in the senate providing for a state board of examiners in optometry.—J. A. M. A.

Dr. Josef Herrnheiser, instructor in ophthalmology at the University of Prague and for many years editor of the Prager Medizinische Wochenschrift, died recently at Prague

We have to record the death of Dr. Nathaniel Feuer, which took place November 25, 1902. He was professor of ophthalmology at the University of Budapest, and was 58 years old.

The programs of the several sections of the American Medical Association for the New Orleans meeting are published in the issue of April 11, 1903, and among them that of the section on ophthalmology may be noted to be specially complete.

Dr. H. V. Würdermann of Milwaukee has been visiting with Dr. Jno. E. Weeks in New York before sailing for Europe where he attends the International Medical Congress in Madrid, Spain, as a delegate from the American Medical Association.

The headquarters of the Section on ophthalmology of the American Medical Association will be held at the Gruenwald Hotel, and the meeting place the Hall of Pharmacy, New Orleans. The Section on Otology and Laryngology will meet in the same building.

Trachoma Department—On Oct. 20, 1902, the health department opened as a part of Gouverneur Hospital, a special department for the treatment of contagious eye diseases. Between that date and January 3,791 cases were treated, the majority of which were of trachoma.—*Jour. Amer. Med. Ass'n.*

Prof. Dr. Wm. Uhthoff of Breslau, Germany, will be the guest of the Section on Ophthalmology of the American Medical Association at the New Orleans meeting and will give an address on "Congenital total Blindness, Based on a Study of Nine Cases." He will also speak at the annual dinner for which an interesting program has been arranged.

Address on Ophthalmology at New Orleans.—Dr. W. Uhthoff, professor of ophthalmology in the University of Breslau, and one of the best known authorities on the pathology and bacteriology of the eye, will give an address before the Section on Ophthalmology of the American Medical Association at New Orleans in May.—*J. A. M. A.*

Treatment of Trachoma.—The Bellevue and allied hospitals have established a clinic for the treatment of trachoma.

It appears that many children have been excluded from school on account of disease, and the various hospitals having facilities for treating it are very much overcrowded. A ward is provided and patients kept over night and longer if necessary. —Am. Medicine.

Eye and Ear Infirmary Reports.—The twenty-sixth annual report of Buffalo Eye and Ear Infirmary shows that during the past year 2,363 new cases were treated; of these 1,675 had diseases of the eye. 336 diseases of the ear, 260 diseases of the nose and throat, and 92 diseases of the skin. The total number of patients admitted since the opening of the institution was 37,786.—Jour. Am. Med. Association.

Injury of Eye from Contact with Podophyllin.—Rocca-Serra has witnessed a number of cases of an eye affection in operatives which was finally traced to the manipulation of podophyllin. The dust from it affects the eyes much in the same way as it acts on the intestines when taken internally, inducing a kind of neuroparalytic keratitis in time or an iritis which runs a rapid course, and subsides in a week after removal of the cause.—Jour. Amer. Med. Ass'n.

Dr. de Schweinitz has appointed as assistant surgeons in his service at the University of Pennsylvania: Dr. John T. Carpenter, Dr. Howard Mellor, Dr. A. G. Thomson and Dr. Edward A. Shumway. Dr. Mellor remains chief of the dispensary and Dr. Carpenter is the instructor in ophthalmology. The course has been changed, so that attendance on ward classes and clinics is made obligatory for the whole class, instead of electives as before.—Ophthalmic Record.

A New Eye and Ear Hospital for the Bronx.—A new hospital and dispensary, to be called the Bronx Eye and Ear Infirmary, was incorporated recently at Albany under a permit from the State Board of Charities. The incorporators were Drs. Charles H. McIlwaine and Everett M. Raynor and Messrs. Christopher H. Roberts, James C. Mackenzie, and James Dalton. The dispensary, which is open daily except Sunday from 2 to 4 P. M., is located at 660 East One Hundred. and Forty-seventh street.—N. Y. Med. Record.

Lea Bros. & Co. have concluded that it will be to the interest of the authors who have contributed to the work on the Eye, Ear, Nose and Throat issued under the editorship

of Posey and Wright, to offer it to the public in separate volumes as well as in its present single volume form and the price of the separate volumes will be proportional to that of the one volume book with small increase in consideration of the necessity of two bindings instead of one Vol. I, on the Eye will, be priced at \$4.00. Vol. II on the Nose, Throat and Ear, at \$3.50.

The "Jamaica Ginger Case" which was tried in the Superior Court, resulted in a disagreement of the jury after a trial of 14 days. The jury stood 9 for Dr. Brehm, the blind plaintiff, and 3 for the drug firm. Four cases are pending, 3 for blindness and 1 for death, alleged to have resulted from drinking essence of Jamaica ginger containing wood alcohol.—J. A. M.A.

Dr. Ferdinand Weyert, senior physician and chief of the directorate of the St. Petersburg Eye Institute, an eminent ophthalmologist, died at his home in St. Petersburg February 3, after a brief illness, age 66. He was graduated from the University of Dorpat, pursued post-graduate studies in Vienna, Paris and Berlin, where he was a student of Albrecht v. Graefe, and on his return to St. Petersburg became connected with the Eye Institute, of which he was an honored official for more than forty years.—Journal of the Am. Med. Ass'n.

Affections of the cornea.—The following recommended by Fedorow in Westnik Opththal. in conditions causing infiltrations of the cornea:

R	Ichthyol.....	gr. iss	10
	Cocaine hydrochlor.....	gr. iiss	15
	Vaselini.....	gr. lxxv	5

M. Fait unguentum. Sig: Apply locally to the cornea.

—Jour. Amer. Med. Assn.

Bequest to Manhattan Eye, Ear, and Throat Hospital.—Mrs. Ann Augusta Thomas, widow of General Samuel Thomas, and her children, Mr. Edward R. Thomas and Mrs. Livingston Beeckman, have given \$50,000 to the Manhattan Eye, Ear, and Throat Hospital to endow a ward of ten beds, to be known as the "Samuel Thomas Memorial Ward" in the proposed new hospital building for that institution. Announcement of this gift was made at the meeting of the Board of Directors yesterday by Dr. Walter Chappell.—N. Y. Med. Record.

A New Eye, Ear, and throat Hospital in Philadelphia.—The will of Dr. Bushrod James, which was probated last week, devise to the city of Philadelphia \$55,000, several pieces of real estate in the city, and several lots at Island Beach, N. J., for the purpose of establishing in Philadelphia a free hospital for the treatment of diseases of the eye, ear, throat, and lungs. The will directs that the 55,000 be invested as an endowment fund. The proposed hospital is to be called the Washington James Eye and Ear Institute.—New York Med. Record.

Trachoma in Germany.—The medical inspectors of the schools of Prussia did not find a single school in which less than 5 per cent. of the children were affected with granular lids. In the villages the proportion averaged 20 to 48 per cent. and at one place more than half the children were affected. Raehlmann states that more than half a million persons suffer from trachoma in three provinces alone. The government appropriates every year \$87,500 to fight it but still more energetic measures are demanded by the Berlin medical press.—J. A. M. A.

The Eyelids in the Gore Case.—The cable reported the death of Ellen Gore in Paris from a bullet wound in the eye, and the arrest of the man who was alone with her at the time. The man has since been released on the sole ground that the lids and lashes of the eye penetrated by the bullet were intact. The medical experts, Socquet and Brouardel, testified that there was every probability that the injury was due to an accident, as the victim of an attempt to murder would naturally close the eyelids, or at least they would flutter more or less. The fact that they were intact in this case, they said, indicated that the victim was tranquil at the moment the ball struck her.—Jour. Am. Med. Association.

In the Egyptian Medical Congress.—In the Section of Ophthalmology the whole time was taken up in discussing Egyptian Ophthalmia and trachoma, which work such fearful havoc in this country. Dr. E. C. Fisher brought forward certain prophylactic measures, by means of which it is hoped that the frequency of these complaints may be lessened. These consist chiefly in the enforcement of the obvious hygienic measures: Supplying the villages with pure water,

by means of wells, rather than permit them to use the polluted river water; removing cattle and horses away from the houses, so as to lessen the plague of flies, and endeavoring to instil in the people's minds the dangers of neglect of the elementary rules of hygiene.—New York Med. Record.

Methyl Alcohol Blindness.—The trial of the suits against a Baltimore drug firm for blindness due to the use of methyl or wood alcohol instead of grain alcohol in the manufacture of essence of Jamaica ginger, began in the superior court, January 22. The first suit for \$30,000 was brought by Dr. Geo. A. Brehm, of Rolandville, who claims to have been made entirely blind two days after drinking three bottles of the essence on July 27, 1898. He bought the preparation from a storekeeper on Elliot's Island, Dorchester county, where he then lived. Dr. Reid Hunt and Dr. Henry P. Hynson, druggist and ophthalmologist, testified.—Journal American Medical Association, January 31, 1903.

Eye Disease in New York.—In the 10 days since the Gouverneur Hospital building was transformed into an eye hospital 2128 cases of trachoma in school children have been treated, and in 116 of them, operations were necessary. There might have been more operations if the doctors could have preformed them, but, on account of the great number of patients, only the most in severe cases could be operated upon. Instead of two physicians there will in the future be 4 on duty all afternoon. in order that the children may secure proper treatment. It is said that among 6000 school children on the lower East Side, from 12 per cent. to 15 per cent. have trachoma. In Brooklyn no less than 1979 children have been excluded from school since September 18 last because of eye disease. In all, 6347 pupils were dismissed because of some disease.—Phila. Med. Journal.

Gonorrheal Ophthalmia Infection from a Kid Glove.—Griffith, Fredrick, M. D. (Journal of Cutaneous and Genito-Urinary Diseases, December, 1902, p. 557.) The point of interest in this case is the mode of infection of the little patient, J., a boy of eight years, while at play in the street, found a lady's kid glove, which he put on and wore for the remainder of the day. From rubbing his face his left eye became infected and at the end of twenty-four hours inflammation had

closed the lid. Owing to ignorance of the character of the affection, upon the part of the boy's mother, home remedies were first used, and later, when the child was brought to the hospital, it was found that ulceration and sloughing of the cornea had destroyed the sight. Later the shrunken, distorted organ was removed. The gonorrheal patient is a constant source of danger to himself as well as those with whom he comes in contact; as the unfortunate termination of his case demonstrates.—*Western Med. Review*, Jan., 1902.

Presbyterian Eye, Ear and Throat Hospital.—The twenty-fifth anniversary of the founding of this special hospital, one of the largest of the kind in America took place January 9. The report shows that 11,317 patients were treated during the year, representing 40,204 visits. The patients were divided as follows: Eye department, 7,137; ear department 2,007; throat department 2,103. The question of endowment was discussed, and the secretary announced that offers amounting to \$15,000 had been made conditional on the collection of an equal sum. Dr. Francis M. Chisolm was reelected secretary, and Drs. Hiram Wood and John A. Winslow members of the board. The institution owes its origin to the energy of Dr. Julian J. Chisolm at present emeritus professor of eye and ear disease in the University of Maryland, who has retired from practice and resides at Petersburg, Va.—*Jour. Am. Med. Association*.

The death of Dr. Panas, the well known ophthalmologist and surgeon of Paris, at one time president of the Academie de Medecine, is noted. He was a Greek, born in the Ionian Isles in 1831, but educated in France, and became interne, demonstrator of anatomy, prosector, then professor agrege and surgeon to the hospitals, and was finally appointed in 1879 to the newly organized chair of ophthalmology. There are few questions in ophthalmology to which he has not brought some important contribution. His name is particularly connected with method of tenotomy, his operations for ptosis, strabismus, cataract and neoplasms of the eye, and his studies on interstitial keratitis and glaucoma. His *Manual of Ophthalmology* is a classic. He was "chef de service" at Saint Louis Hospital during the siege of Paris, and served also as volunteer surgeon in the barracks, while at the same time he was

holding daily thronged eye clinics, and was studying German. During the Greco-Turkish war he organized and personally took charge of a relief ambulance. These experiences and vast learning, his knowledge of the ancient classics and long training in anatomy and general surgery, his alert clinical sagacity, marvelous technic and imperturbed sang froid, combined to place him in the front rank.—*Jour. Amer. Med. Assn.*

The Latest "Discovery" from Paris.—The *Revue des Revues* states that Professor Pete Stein has invented an apparatus which not only restores lost sight, but gives vision to those who have been blind from birth. Dr. Caze, who publishes the announcement, says that Professor Stein took him into a dark room and securely bandaged his eyes so that he could not possibly see. The lamp was then lighted and the apparatus was then fastened around his temples when instantly he became conscious of a dim light. The light became stronger, and he was now able to count the professor's fingers when they were held up before him and to enumerate other things in the room. Just as he was feeling that his vision was clearing and he was convinced that he would soon see normally, the apparatus was suddenly removed and he was left in total darkness. Professor Stein rests his claim on the theory that man does not see with the eye, but with the brain, the eyes only serving to receive the image, which the optic nerve transmits to the seat of perception and if, therefore, the image can be transmitted to the brain without eyes a blind person can see as well as any body else.—*Am. Medicine.*

Postdiphtheric Ocular Paralysis.—Schwenk notes that the ciliary muscles are more frequently involved than any other portion of the muscular system except the velum palati. Diphtheric paralysis is generally bilateral, and the total hypermetropia after this exceeds all that can be rendered manifest by any cycloplegics after the patient has recovered from the paralysis. The paralysis manifests itself in two to six weeks after the attack of diphtheria, and generally passes off in about the same time. When the external muscles are affected the duration is generally short, except when the internal recti are involved. The external rectus is peculiarly liable to be affected. The seat of the lesion is still under

discussion. It is impossible to account for active pupil, the frequency of paresis rather than paralysis, and the bilateral character of the lesions an any other theory than the peripheral one. (H. M.)—Dr. P. N. K. Schwenk in Medical News.

The following letter and memorandum has been received for the ANNALS from Dr. Kenneth Scott.

POST RESTAUTE, CARIO, Feb. 22, 1903.

Dear Sir:—Lord Cromer's absence on train in the London has unavoidably caused delay in settling the manner of disposal of Sir Ernest Cassels recent gift in Egypt. I now beg to send you the enclosed full particulars of it for publication.

Yours truly,

KENNETH SCOTT

F. R. C. S.

Dr. B. E. FRYER,


(7 Manchester Square

 Annals of Ophthalmology,

London W.)

U. S. A.

The recent generous gift of £40,000 entrusted to Lord Cromer and his successor in office, by Sir Ernest Cassel, for the relief of ophthalmia and eye diseases and for the training of qualified men for such work, in Egypt, was the direct outcome of the Khedive expressing interest in the subject as contained in the proposal for an Ophthalmic research hospital, which had been submitted by W. Kenneth Scott, ophthalmic surgeon of London, in the hope that the funds required for starting it might be provided.

 The officials of the Sanitary Department Egyptian Government into whose hands the expenditure of the sum has virtually passed have decided to employ it in establishing a test in the form of a traveling dispensary; to suffice for all purposes of operation and treatment and to work solely in the provinces. They will appoint an additional English inspector for a temporary period to travel with it accompanied by a native Egyptian doctor, a post graduate local medical student, two male hospital attendants and two servants. Beyond the initial cost of about £250 its maintenance, inclusive of salaries is estimated at £900 per annum.

Wood Alcohol Poisoning Cases.—The trial of the wood alcohol poisoning cases in the Baltimore Court was the leading medical feature of the week. The court refused to ad-

in the analysis of Jamaica ginger made by the drug firm two years ago after the alleged poisoning. He also refused to take the cases from the jury and decide it himself. A former employe of the drug firm testified that the latter used wood alcohol in the preparation of Jamaica ginger from 1897 to 1900, the proportions used being: Wood alcohol, 30 per cent; grain alcohol, 50 per cent; and water, 20 per cent. The attorney for the defense acknowledged that this proportion was correct and that in the three years 65,376 bottles of the preparation were placed on the market. Drs. Herbert Harlan and Hiram Woods testified that Dr. Brelin's poisoning was due to wood alcohol. Dr. Clara A. Crampton, a government chemist and head of the medical revenue department; W. A. Parkier, professor of pharmacy in the University of Illinois; and F. P. Knecht, a manufacturer of flavoring extracts at St. Louis, testified that wood alcohol, in the preparation, was not necessary.

The Brelin case attracted the extreme newspaper interest. The experts for the defense have contradicted the statements of the individuals who testified that grain alcohol was used in the preparation of Columbian spirit, not more than grain alcohol. Frederick T. Gordon, a pharmacist in the navy, testified that he tried grain alcohol as a tonic. He also fed a cat a more concentrated dose, for a month without harmful result. Dr. E. L. Whitne, had taken one and one-half ounces of Columbian spirit in three hours without bad effect. A special feature was the drinking of a quart of two ounces of Columbian spirit by M. Walton E. Gilbert, one of the defendants. It was freely diluted with water, and no apparent ill effects were experienced. The counsel began arguing the case the week—*Journal of the American Medical Association*, Jan. 31, Feb. 7, and Feb. 14, 1903.

Cataract in India.—The enormous number of operations done for cataract by ophthalmic surgeons in India is amazing. In a recent article R. H. Elliot, of the Government Ophthalmic Hospital, Madras, reports a series of 509 consecutive operations for primary cataract performed in 1902 months. A little over a year ago several of the great cataract operators of India published articles on this subject. At that time T. H. Pope based his conclusions on the subject of cataract extraction on 5,290 operations between 1896 and 1901 and over

4,000 done before 1896. Mr. Henry Smith, of the Jullender Civil Hospital, reported 1,804 extractions of cataract from June 1, 1899, to May 1, 1900, and 1,650 extractions from May 1, 1900, to April 2, 1901. Mr. J. Lewtas wrote of 147 extractions during the "past three months." Mr. Park of Jaipur reported 2,414 operations in five years. Mr. Collins, the assistant surgeon of the Madras Government Hospital, who helped Mr. Elliot in his operations has seen about 12,000 extractions.

To make these numbers more appreciable, it is interesting to compare the number of cataract operations done in the largest eye hospital in America. At this hospital with its 25,000 to 30,000 new eye patients per year, 180 extractions were done in 1899, 182 in 1900 and 262 in 1901. And it is striking to compare the numbers reported by the Anglo-Indian surgeons with those of the greatest cataract operators in America. This surgeon who began as long ago as 1868, when he reported 200 extractions, speaks, in private letter, of having done over 4,000 cataract operations, and of his despairing of living long enough to do another 1,000.

When Mr. Smith's report appeared we were, of course, astonished at his statement that he had done 44 extractions on each of two days, and the conclusion seemed fair that a record of 44 operations for cataract in one day would for years remain unbeaten. Mr. Elliot has broken this record. On one day he did 53 extractions. This certainly is the record for cataract operations in one day, and will probably stand for a while. On three other occasions Mr. Elliot did more than 40 extractions in one morning.

Noting this immense number of operations, the idea occurs to one's mind that maybe the very numbers would make these operators careless. The reading of these articles banishes this idea. For instance, Pope, in his general remarks, gives it as his opinion—after 9,000 operations—that the surgeons should refrain from being in a hurry to publish his views in regard to what he thinks is the best method of operation and as to what are the cause of different complications. The articles from Elliot, which, by the way, we imagine may be considered as a report of the latest methods and views from the Government Ophthalmic Hospitals Madras, is full of interest. Of course, anything on cataract coming from the Madras

hospital must command attention; a few of the procedures practiced by Elliot are particularly worthy of note. That of lacerating the capsule of the lens, as he does it, by means of a Bowman stop-needle, before the section is made, appears to have advantages over the method as practiced in this country and Europe,⁶ of doing the capsulotomy after the section is made. He also calls attention to the value of morphia given hypodermically when the patient is nervous and will not obey. As a routine procedure, iridectomy is performed, and at the time of the extraction; in the 500 cases iridectomy was done in 484 of them. He washes out the cortical debris by irrigation, using MacKeown's irrigator, and says he owes a debt to Professor MacKeown for allowing him to witness his method of using his apparatus. This irrigator, according to Elliot, by removing debris expedites recovery and minimizes the need for subsequent capsulotomy, dispenses with the introduction of instruments into the eye after the escape of the nucleus, and has enabled him to operate fearlessly on a large number of very immature cataracts, in which, without it, he would not have ventured to interfere.

It would seem that an operation like that of extraction of cataract (we might modify this statement by speaking of the operation in the hands of the average operator) could have been perfected by this time. This has not been done and argument over different methods and procedures continues in the highest quarters. In the final adjustment of this operation, we venture the opinion that the method of the Anglo-Indian ophthalmic surgeons will have an important place.—*Jour. Amer. Med. Assn.*, Jan. 17, 1903.

Sequelae of Typhoid Fever as Related to the Eye, with Especial Reference to the accommodation.—George H. Price discusses the condition of paresis or paralysis which so often follows typhoid fever. From clinical and from pathological studies made, the condition can be assumed to be as follows: The axons from the motor nerves of the ciliary ganglion distributed through the ciliary nerves to the muscular apparatus residing in the ciliary body, which is quite vascular, are subjected to the typhoid bacillus carried by the blood, until there is set up a neuritis, which, extending back to the ganglion, induces changes in the nutrition of these cells, which may go on from simple disturbance to complete de-

struction of the cells. Since the author has studied the pathology, as reported by Nichols, he is of the opinion that the most reliable means of combating the condition lies in some preventive measure; that is, some internal medication during the progress of the disease which will prevent, if possible the complication to such a marked extent of the nervous system. During convalescence he would suggest that the patient would refrain from any near use of the eyes, so as to prevent any taxing of the nerve supply and muscular mechanism while it is unable to stand this strain, and which would keep up the irritable condition.—Nashville Journal of Medicine and Surgery.

Among other papers read at the meeting of the medical Society of the State of New York—January 27 to 29, 1903 were those of Dr. Edgar S. Thompson, Justin L. Barnes and Lucien Howe. A summary is given below.

Treatment of Purlent Conjunctivitis.—Edgar S. Thompson (New York) while expressing the opinion that the only sound guide to the treatment was a bacteriologic examination of the discharge, advocated prompt treatment by energetic measures when there was reason to suspect a virulent infection, such as from the gonococcus. Under such conditions there was no better application than a 2 per cent. solution of silver of nitrate applied to the upper cul de sac, as well as to the other parts of the conjunctiva. For the abortive treatment a 3 per cent. or 4 per cent. solution should be used, following this strong application by sodium chlorid to neutralize the effect. In the treatment of ophthalmia neonatorum at 6 per cent. solution of protargol was recommended, as it was efficient and nonirritating, but for gonorrheal ophthalmia it was decidedly inferior to silver nitrate. Of course, in addition to the use of the applications already mentioned, the eye should be irrigated with boric acid solution sufficiently often to keep it free from the discharge.

Transportation and the Ophthalmic Referee.—Justin L. Barnes (New York) considered the means employed by our transportation companies to detect color-blindness among their employes. He had ascertained that about one-third of the railway companies relied upon laymen for these examinations, whereas the public safety demanded that they should at least have an ophthalmic referee for the doubtful cases.

The eyes should be tested singly, otherwise color blindness in one eye might escape detection, and it was conceivable that an engineer might at any time have the good eye temporarily disabled while at his work. Some color-blind persons were able to distinguish colors quite well by difference in the degree of illumination, but such a method could not be relied on under the ever changing atmospheric conditions present in actual practice.

Discussion.—Percy Fridenberg (New York) said that while this question was much of practical importance, there were two sides to it. From the standpoint of the railroad men it was obviously unfair to subject to test in matching colors and picking out slight variation in shades when in their work they were only called upon to decide between two or three widely different colors. Persons having defective color sense at the macula were able, by moving the eye, to distinguish correctly the colored wools, whereas, with a single point of illumination the result was very different.

Eyestrain and Headache.—Lucien Howe (Buffalo) presented an explanation of how eyestrain caused headache. By the term "eyestrain" he meant the pain experienced by some persons when reading, sewing or doing near work. This pain was referred to the eye itself, the forehead or some part of the head, or possibly even to the shoulders. The proposition which the author sought to prove was that this pain was due directly to some muscular contraction. According to the theory of Helmholtz the ligament of Zinn was tense when the eye was at rest and relaxed more and more in proportion to the degree of accommodation. A better explanation had been offered recently by Prof. Tscherning. This observer contends that the act of accommodation is not altogether passive, as Helmholtz believed, and that on looking at a near point the ciliary muscle is contracted. This draws the edges of the lens, bends the central portion of the anterior surface further forward, and makes the lens more convex. On this theory that near vision was entirely an active muscular effort it was not difficult to explain the pain in the eyes, which constituted the first feature of ocular headache. Moreover a certain amount of accommodation always meant a certain degree of convergence of the visual axes, which implied tension of the internal recti and also, to a certain extent, of the superior and inferior

recti. The accessory muscles of the forehead and head were called into action when any special effort was required to maintain accommodation, and it was the tension of these accessory muscles which gave rise to the headache. The occipitofrontalis was an important muscle in this respect, and both the anterior and posterior portions were subject to strain in connection with special effort to maintain accommodation. This explained the frontal and occipital headache.

PROGRAM OF SECTION ON OPHTHALMOLOGY, A. M. A.

Chairman, John E. Weeks, New York; Secretary, Frank C. Todd, Minneapolis.

Address of the Chairman.

Vernal Conjunctivitis, Wm. Campbell Posey, Philadelphia.

Subtropical Trachoma, with Special Reference to a New Therapeutic Agent, Ruffin A. Wright, Mobile, Ala.

The Treatment of Trachoma, Edgar Doak Capps, Fort Worth, Texas.

The Action of Adrenalin in Acute Conjunctival Inflammation, Louis J. Lautenbach, Philadelphia

Experimental Study on Some Methods of Combating Post-Operative Infection of the Anterior Segment of the Globe, E. C. Ellett, Memphis

Ocular Complications of Bright's Disease, Louis Stricker, Cincinnati.

Subconjunctival Medication with an Especial Reference to the Use of Salt-Sugar Solution in Acute Affections of the Anterior Portions of the Eye, Howard Mc I. Morton, Minneapolis.

Albuminuric Retinitis and the Decapsulation of the Kidney, George F. Suker, Chicago.

SYMPOSIUM ON THE INFLUENCE OF THE CERVICAL SYMPATHETIC ON THE EYE.

(a) Experimental Researches Regarding the Influence of, the Cervical Sympathetic on the Eye, Geo. E. de Schweintz, Philadelphia.

(b) The Influence of Resection of the Superior Ganglion of the Cervical Sympathetic in Glaucoma, Wm. H. Wilder, Chicago.

(c) Influence of Resection of the Cervical Sympathetic in Optic Nerve Atrophy, Hydrophthalmus and Exophthalmic, Goiter, James Moors Ball, St. Louis.

(d) Pathology of the Cervical Sympathetic, John E. Weeks New York.

Arteriosclerosis (Endarteritis) and Its Bearing on Retinal and Chorioidal Lesions, Chas. Steadman Bull, New York.

Study of the Nerve Head in Relation to Certain Other Fundus Anomalies, Chas. H. Beard, Chicago.

Retinal Disease Limited to the Region of the Macula Lutea, Henry Gradle, Chicago.

Address: Congenital Total Blindness, Based on a Study of Nine Cases, Prof. Wm. Uhthoff, Breslau, Germany.

Pathologic Exhibit, prepared by a committee consisting of Casey A. Wood, Chicago; Edward A. Shumway, Philadelphia, and H. V. Würdemann, Milwaukee, Wis.

Report of committee:

Method of Preparing and Preserving Ophthalmic Specimens for the Museum, Address by Chairman, Casey A. Wood.

Some Points in the Pathology of the Eye. Illustrated by the Present Exhibit of Morbid Growths, Edward A. Shumway.

SYMPOSIUM ON THE BACTERIOLOGY OF THE EYE.

Bacteriologic Exhibit, prepared by a committee consisting of R. L. Randolph, Baltimore; Brown Pusey, Chicago; and Edgar Thompson, New York.

(1) The Bacteria Concerned in the Production of Eye Inflammations; address by Chairman, Robert L. Randolph.

(2) Bacteria in the Conjunctiva, Cornea, Iris, Ciliary Body and Chorioid, and Changes Caused Thereby. (Illustrated by projection with a lantern of section and lantern slides.) Brown Pusey, Chicago.

(3) The Essentials and Unessentials of Ophthalmic Asepsis, Harold Gifford, Omaha.

Development of the Fusion Center in the Treatment of Strabismus, Nelson M. Black, Milwaukee, Wis.

A Set of Charts for Stereoscope To Be Used for an Amblyopic Eye or for Treatment of Squint, Albert B. Hale, Chicago.

Cramp of the Ciliary Muscle Due to Eye-strain, J. W. Wright, Columbus, O.

Skiascopy as a Method of Precision, Edward Jackson, Denver.

Some Observations on the Eye Complications of Smallpox During the recent Epidemic in Cleveland, A. R. Baker, Cleveland, O.

Some Rare Corneal Complications in Ophthalmia Neonatorum, A. A. Hubbell, Buffalo, N. Y.

Skin Grafting on the Eyelids, Oscar Dodd, Chicago.

Entropion and the Operations Employed for Its Relief, John O. McReynolds, Dallas, Texas.

Sympathetic Ophthalmia as the Result of Trauma in the Ciliary Region, John Sabert Mott, Kansas City, Mo.

A Case of Syphilitic Orbital Periostitis and Optic Neuritis, in which Vision Was Nearly Extinguished But Fully Restored, F. C. Hotz, Chicago.

Traumatic Lesions of the Ocular Adnexa; with Report of a Case of Contused Wound of the Eyebrow Resulting in Complete Monocular Blindness Unaccompanied by Ophthalmoscopic Changes, Ellet O. Sisson, Keokuk, Iowa.

Exhibition of Specimens and New Instruments.

Extraction of the Crystalline Lens in High Myopia, H. V. Würdemann and Nelson M. Black, Milwaukee, Wis.

The Management of Myopia, J. H. Caliborne, Jr., New York.

Suggestions on the Pathogenesis of Glaucoma, N. J. Hepburn, New York.

Report of a Case of Complete Absence of Both Eyeballs at Birth, Lawrence R. Ryan, Galesburg, Ill.

Calcarous Degeneration of Corneal Cicatrices, H. Moulton, Fort Smith, Ark.

Ocular Incoordination and Cerebral Reflexes, F. Park Lewis, Buffalo, N. Y.

The Voluntary and Involuntary Brain Centers Controlling the Ocular Muscles, G. C. Savage, Nashville, Tenn.

Remarks on the Horopter, Geo. T. Stevens, New York.

Our Present Knowledge of the Cerebral Centers of the Eye, C. Barck, St. Louis.

The Ophthalmic Section of the A. M. A. meeting at New Orleans was well attended and the program was of exceptional interest, very few of those who contributed papers not being present to read them.

The Section business was finished Thursday evening, Dr. R. L. Randolph, of Baltimore being elected president and Dr. A. E. Bulson, of Fort Wayne, Ind., secretary for the ensuing year. The next meeting will be held at Atlantic City.

BOOK NOTICES.

The American Year Book of Medicine and Surgery.

The American Year Book of Medicine and Surgery, 1903, two volume. Vol. I including general Medicine, Octavo, 700 pages, fully illustrated. Vol. II General Surgery, Octavo, 670 pages, fully illustrated. Philadelphia, New York, London, W. B. Saunders & Co. 1903. Per volume cloth \$3.50 net. Half Marrocco, \$3.75 net.

This is a work of great value to the profession at large and to those with practice limited to Eye, Ear, Nose and Throat, the chapters devoted to these branches this year are of particular interest and appreciable worth.

Under the chapter on ophthalmology the following subject have received careful painstaking consideration from the very capable editors, Dr. Howard Ford Hansell and Dr. Wendell Reber of Philadelphia, Pa. Refraction, Muscles, Lens, Therapy, Optic nerve, Eye in General Disease, Cornea, Operations, Chorioid, Retina, Conjunctiva, Lids. New Instruments, Lacrimal affections.

Each and every one of the above subjects, have under the masterly abstract treatment by the editors, developed many invaluable points of especial interest and advantage to the conscientious ophthalmic surgeons and this chapter will undoubtedly be read with much pleasure and profit.

E. W. TOLLEY.

Spring Catarrh of the Eyes.

H. Danvers, M. D. Illustrated with 3 plates, pp. 60, with bibliography, London, 1901.

We have received this comprehensive essay upon a chapter in Ophthalmology which has, until recent years, been veiled in obscurity. As long ago as 1846, Arlt described certain characteristics of what appeared to be a new disease of the conjunctiva; von Graefe recognized the disease and thought it to be gelatinous infiltration of the corneal limbus, while it remained for Saemisch to remark the exacerbations of the disease in warm weather and give it the name of spring catarrh. Since those days until Danvers and Terson, all investigators have been seeking for the cause and have

been applying remedies for the cure of the disease. In spite of the increasing carefulness in the diagnosis of conjunctival affections, ophthalmic surgeons see the disease but rarely. It is more prevalent in southern countries and appears to be favored by certain localities of the same latitudes, and it is seen to appear after a native has returned from abroad. Atmospheric variations decidedly affect the time of appearance of the disease, it being manifested chiefly at the end of spring and during the hot weather. The disease is sporadic and non-contagious, attacking no special class of society, nor is it influenced by occupation or exposure to the sun's rays—neither is it hereditary. More males than females are affected by it.

The initial symptoms are insidious and may be similar to those of catarrh without injection. In a few days one or more small tumors appear either on the conjunctiva of the bulb, or on the upper lid; the seat of the tumor varies in different countries. In the bulbar variety the growth, usually a single ovoid reddish grey or yellow tumor, appears at the limbus in the palpebral fissure; or clusters of little warty or vascular tumors the size of a pin's head,—these are greyish or light brown and usually at the nasal or temporal side of the cornea.

The clusters may become confluent and encircle the cornea; they are limited by it though losing themselves in the bulbar conjunctiva. The tumors are hard, tense, grating on section, as though fibrous, and without juice. The sites may differ in different years. In the tarsal variety, the tumors are more abundant at the central portion; they are reddish and early assume a fungoid appearance. The lower lid is seldom involved, neither are the plica or the follicular folds affected. The conjunctiva is bluish white as though a film or milk were spread over it. The secretion is "more a lachrimation than a catarrh." The lashes are not affected. The cornea is not primarily involved but remains clear. The author quotes three cases and cites one of his own in which the cornea was seriously affected. The sclera is discolored and injected. There is ptosis and the patient has a sleepy expression. Photophobia may be marked. Vision is not altered and the iris is unaffected. Both eyes become involved, yet not simultaneously nor equally. The disease is chronic; it diminishes in autumn, either disappears or lies dormant in winter, and recurs in the spring. These cycles may return for ten years.

The author details the interesting histories of three of his cases. In the first case portions on the bulb were excised for diagnosis. The excisions had apparently no effect upon the progress of the affection, although the traumatisms healed promptly. In the second instances the tumor had been diagnosed as a sarcoma, though the diagnosis was disproved by the histologic study.

In the third case the cornea was seriously affected. All of these cases had chronic nasopharyngeal inflammation associated.

The preparations from which the histologic studies were made were taken from one case at its very commencement before any medication had been applied, from another at the third year of recurrence in both eyes, and from a chronic form at the tenth year of recurrence.

The sections from the bulbar portion of the conjunctiva showed marked change in the epithelial covering, consisting of hypertrophy and proliferation of the cells, which are arranged into strata and project conelike into the stroma in the manner of epitheliomatous nests. In all the sections these two elements were not found to communicate but remained unbroken and distinct. The epithelial changes are the chief and most constant, although the stroma is increased and hypertrophied. In the sections from the tarsus the stroma shows more marked hypertrophy and proliferation, and limits the epithelial invasion. The nature of the underlying tissues in the tarsus and the limbus influences the structure of the growth and determines whether the epithelium or the connective tissue shall predominate.

The histologic study proves conclusively that the disease is not associated pathogenetically with trachoma, notwithstanding the observed fact that trachoma may arise in the course of the disease. All efforts in the search for a specific bacillus have been futile. Gallenga, of Parma, suggests the cause to be due to an autoinfection, bearing in mind the frequency of the association with it of general skin eruptions, as of localised eczema, especially about the lips and nose. The author adheres to the opinion that the general polyadenitis so constantly seen in the cases has a marked influence in the production of the disease, yet Natanson claims that Spring Catarrh is extremely rare in Russia where nasal diseases are most common.

The growths resemble papillomata, yet more especially they resemble epitheliomata except in so far as the stroma interferes with the progress of the epithelial proliferation. The epithelium rapidly degenerates from a lack of blood supply. They may be looked upon either as modified epidermoidal or fibromatous tumors depending upon the predominance of the one or the other of the two elements.

The points to be observed in diagnosis are these: The granulations as found on the surface of the tissues are flat, fleshy, pedicled growths; they never ulcerate on bulb or tarsus; corneal ulcerations or pannus are rarely seen; the conjunctiva of the tarsus has a bluish tinge; the disease heals without leaving traces behind; and the non-effect of treatment. In episcleritis the conjunctiva is inflamed, but in the Spring Catarrh we have a painless and pale, movable tumor. Only by a study of the case can the diagnosis of sarcoma or epithelioma be verified.

The prognosis in both forms of the disease is good as to final cure, but very doubtful as to duration. The bulbar variety is the more favorable form. In most cases spontaneous cure follows without leaving traces behind. Vision is unaffected; the cornea is rarely involved, although a large tarsal growth may press upon it and mechanically affect it; a ptosis may persist.

In the author's hands, ice cold packs applied to both eyes for ten minutes five or six times a day is a natural and gratifying form of treatment. Attendance to the general health and care in diet, and exercise in the open air with eyes unbandaged or unshaded, except by broad-brimmed hat, will yield the best results.

Any affection of the naso-pharynx should be attended to promptly. A northern and mountainous climate is preferable to low-lying sea-side levels. The number of remedies for this relatively mild disease is legion. Only in the tarsal variety is there prospect of alleviation by surgical means.

BURTON CHANCE.

Surgical Anatomy.

A Treatise on Human Anatomy in its Application to the Practice of Medicine and Surgery.

John B. Deaver, M. D., Vol. III. (Illustrated by 178 plates, nearly all drawn for this work from original dissections.)

Abdomen; Pelvic Cavity; Lymphatics of the Abdomen and Pelvis; Thorax; Lower Extremity. Philadelphial. P. Blakiston's Son and Co., 1903.

It is just two years (Vol. 1, April, 1900, p. 195, Vol. 11, July, 1900, p. 557) since I had the pleasure of calling the notice of readers of the *ANNALS* to this beautiful product of American Science and Art, and to-day, with the third volume complete before me, my greatest wish is that I had not exhausted the superlative adjectives of the critic, for I fear that I can find no words, other than those I have used before, to express what ought to be the feeling of every surgeon and physician this side of the Atlantic. Not only have we in Deaver's three volumes of *Surgical Anatomy*, a work which the student and practitioner may or must use as his daily companion, but we can with national pride assert that as an artistic whole it is a work never yet excelled in scientific literature. Textbook, plates, contents and index are marvels of skill. I don't know how anyone can pick up Deaver at any place without intending to possess it; when once possessed, without turning its pages lovingly as one does in a story book in delightful anticipation, and when once thus examined, without making it a table necessity, into which to look for certain help in every detail of professional practical activity.

This third volume may have less technical advantage for us who are restricted within a specialty, but for that reason we should all the more welcome it as a means of carrying us outside our routine, and as an aid to the scientific understanding of the problems that are within the specialty of others. To-day the uterus and the appendix are the anatomical centers of much of the surgical controversy exciting our neighbors, and we are neglecting our duty if we do not try to comprehend the anatomy of these parts. No book within my knowledge gives so clear and vital a picture as does Deaver. Take plate CCCLXII, for instance, where the positions of the appendix are illustrated; and CCCLXVIII with CCCLXIX, and the panorama is better than a hundred pages of text. The gall-bladder in plate CCCLXIII, and CCCLXXV; the uterus and adnexa in plate CCCXCVII, the kidneys and their relations in plate CCCLXXXIX, all explain at a glance what the surgeon is trying to do. There is no end to the knowledge one can gain in this way, and in read-

ing a medical discussion with Deaver at hand, it enhances the enjoyment as much as does the surgical clinic itself.

I do not intend to slight the text by calling emphatic attention to the plates. The publisher's task has been but complimentary to the artists and authors, yet every page shows care. Each anatomical entity is printed in heavy type, the description following is clean, clear and well-spaced lines. In the index each part has its page reference, and in heavy type its plate, so that the description and illustration can be found in a moment. Deaver has combined in his text the descriptive anatomy of the dissecting room and the surgical technique necessary for the operating table, and he has done it well. Whether there are mistakes, must be left to the more critical judgment of his peers, but minor details can be connected; they cannot change, however, the beautiful perfection of these three volumes as a whole, and so long as surgeons work, just so sure will libraries be incomplete without Deaver.

A. B. H.

Bibliographic Clinic. The Origin of Ill-Health of De Quincy Carlyle, Darwin, Huxley and Browning.

GOULD, GEORGE M., M. D., Philadelphia. (P. Blakiston's, Son & Co., 1903. Small 8 vo.; 223 pages \$1.00.)

Dr. Gould, in experimenting with history, has given brief sketches of the lives of 5 great producers of literature, for it is only just to rank Darwin and Huxley among those whose writing will be lasting not only for their science, but for their style. They are not biographies in any sense of the word, nor does the author claim such classification for his effort, but they are excerpts from biographies written by others, not extracts from letters, with original text sufficient to illustrate the intention he has in mind, to show how each man continuously suffered and the cause of this chronic suffering. Each man had years of activity, interrupted by long or short intervals of enforced rest from "near work." Each man tried drugs, doctors and cures; each had a liver, or a stomach, or a diathesis, according to the current diagnosis, and each could recover from the head symptoms only by abandonment of his books and resort to long, desperately long walks out of doors. In none of them was a true examination of the eyes made, or an honest attempt, as would be nowadays, to correct any refractive anomaly. In this sense of the phrase the title *Bibliographic Clinics* is well chosen.

At the end of the fine biographic chapters are four others—Biliousness and Headache; Some Neglected Points in the Physiology of Vision; The Discovery of Astigmatism and Eyestrain; Responsibilities. They are all worth reading, because Dr. Gould is himself no mean stylist, and in his clearness of statement, felicity of phrase and precision of logical purpose, is a model after whom most medical writers might well pattern.

The book is written chiefly for the non-professional reader, and for that reason he takes pains to explain the physiology of vision, the nature and influence of astigmatism, and what credit is due American (particularly Philadelphian) ophthalmology for insisting on the power for evil that lies in an uncorrected error of refraction where the eyes are put to such ceaseless use as they are with us and in most countries of intellectual activity. One can see, however, that Dr. Gould writes between the lines for the practitioner—especially in the last chapter—and criticises the obtuseness of his colleagues who will not recognize in toto the American theory of ocular reflexes whereby many of the ills of our high-strung humans may be traced to an uncorrected astigmatism.

Dr. Gould is admirable, but when he appears before the bar of the reading public, with such special pleading he must expect to meet with opposition, because we are by no means converts, and he must allow us to use arguments which to us are even more logical than are his own to him.

Dr. Gould revels in dogmatism. He says (foot note—page 39—“myopic patients do not have headache.” How long since! What eye doctor can declare that his myopic patients, however free from astigmatism, have no headaches? I wish mine didn’t. But Dr. Gould would answer that I must have overlooked a latent or a very small degree of astigmatism, which is to say that every eye is astigmatic! “It is a poor oculist that has not learned that eyestrain produces constipation” (p. 66). “All oculists know insomnia is a persistent symptom of eyestrain.” “One marvels how a headache can be inherited” (p. 138). It must have come from Adam or Eve, says Gould. “One of the most common symptoms of eyestrain, known to all oculists, is sleepiness when reading by artificial light” (p. 169). He despises (p. 205) the term “passing of the reflex,” but in the same breath abuses the man who dares to admit a functional gastric derangement influencing the

eyes. He sneers at "curing" headache and dyspepsia in the same patient at frequently recurring intervals for years," (p. 206), while postulating in italics that a "recorrection of (astigmatic eyestrain) is necessary every year or two."

But why peruse the contradistinctions further? The book must be read to appreciate the infatuation of the enthusiastic. Astigmatism, eyestrain, is the touchstone for modern ills. Only try the cure on your patients, and you will convince yourself and them of its magic. But how about those whom we try to cure who yet persist in having eyestrain or constipation or functional gastralgia or headache! Oh, the astigmatism was not properly corrected or not sufficiently after recorrection! Is nobody, then, outside of Philadelphia, scientifically accurate enough to correct this subtle astigmatism? Is it the quarter diopter or eighth or sixteenth diopter that alone counts? Did not Hahnemann say that if the 1 X did not cure, the dose should be attenuated and attenuated till the proper dilution was found?

Surely the experience of some of us counts for something. We try to be honest—to escape the mire of the lazy drug-giver and the phontory of the reflexer. The same cry of the omniscient I is nothing new. The oracles of Greece or the Indian medicine man were ignorant enthusiasts, undoubtedly, but there have been others equally enthusiastic but not ignorant. Hahnemann cured head aches, gastric reflexes; the Mitchell rest cure is as potent to-day as when its author (so worthily admired by Dr. Gould) devised it. Haig is no fool, even if some men deny the existence of uric acid, and he has his healthy worshippers as well as his victims; the muscle cutters whom Gould condemns are not so uniformly followed by death and destruction; even the nasal reflex apostles have right on their side when they can demonstrate a choked antrum or an undrained sinus. All these gospels we have heard before; many of them we shall hear—and new ones thereto—again and again.

Oh for the illogic energy of the fanatic, that nearly sacred power that scorns the experience of others! But we cannot all be driven by the same demon. Some of us must show our interest in those subjects which are of universal application, and it is for Dr. Gould's enlightenment that I tell him why 'society programs are made up with papers on operations, tumors and inflammatory diseases.' These are subjects

not restricted to class or country; a sarcoma is the same in Chicago or Cairo, a pterygium is operable in Illinois or India, but an eyestrain is not developed with equal certainty in Pennsylvania or Patigonia. It is a different tongue, the language of the tumorist and that of the refractionist. The high-strung train worker may suffer from eyestrain, and I don't deny for a moment Dr. Gould's regret that De Quincy or Dorwin missed relief which might have come from properly adjusted lenses, but I cannot be convinced that the dispensary sewing girl who has poor food, poor air and little activity for her mind or body, will recover from her headaches even by correcting an astigmatism of one diopter. We are not fools or knaves who use our own judgment to control our interpretation of the complex problems of human physical happiness. Did Dr. Gould never have a patient come back unimproved, even if the astigmatism was again and again fully corrected? Did he never find a patient discard glasses after some health-destroying cause other than eyestrain was removed? If not (a ridiculous impossibility), then his experience is not so great as mine.

Let Dr. Gould take some of his own lessons to heart (p. 211). "Examine the evidence," and he will find that "there are hundreds of horrible conservative physicians who have put their experiences on record or who would willingly testify" that there are other causes than eyestrain for many of the complaints of humanity.

A. B. H.

Pathologic Histology of the Eye.

Ginsberg, Dr. S., Berlin. *Grundriss der Pathologischen Histologie des Auges.* With 107 illustrations. 487 p. Berlin, 1903, S. Karger. 13 M. \$3.25.

This book is intended to serve as a guide to those who, without great experience, wish to do work in pathologic histology of the eye. As the author says in the preface he aimed at a brief description of the microscopic changes of the single parts of the eye with especial regard to the most important characteristics, but not at a harmonious exposition of the processes in the different parts of the whole eye excited by certain diseases. He treats the pathology of the single parts in 11 chapters, viz.: skin and borders of lids, conjunctiva, sclera, cornea, iris, ciliary body, lens, vitreous, chorioid, retina, and optic nerve. Each chapter is preceded

by the essentials of the normal histology. Thorough references in the text and the index, a certain connection in the above mentioned sense is obtained. For a minute study, bibliographies are added to each chapter. The illustrations are true pictures of microscopic sections and are well executed, as well as the whole getting up of the book. The author has by this book supplied a long-felt want and has accomplished his task excellently. Whichever chapter we look up, we find a very clear and satisfactory exposé of what we wish to know, with utilization of the recent literature. It is a very useful book and is to be highly recommended.

C. ZIMMERMANN.

Spectacles and Eye Glasses. Their Forms, Mountings and Proper Adjustment.

R. J. Philips, M. D. Third edition received, with 52 illustrations. 800, 109 pages. Price \$1 00. Philadelphia. P. Blackiston, Son & Co., 1902.

It is ten years since the first edition of Phillips' little volume appeared and the author has had good chance to add some valuable hints to those already given, increasing its size by 12 pages and by fine illustrations. It is a book written by a conscientious eye doctor and ophthalmologist for the painstaking practitioner, and it ought not therefore to be compared with those so-called text books of schools or "professors of ophthalmics." There are, besides the introduction chapters (1) on frames, lenses and glasses, (2) principles of spectacle fitting, (3) prescriptions of frames. (4) inspection and adjustment of spectacles and eye glasses.

The introduction is a history of eye glasses. The body of the book devoting itself to practical rules for understanding of what eye glasses are mechanically, how to prescribe them correctly and how to detect both incorrectness in the lenses and improper adjustment or fit, in frames. The author goes into careful detail when speaking of prisms and shows how little changes may greatly affect the prescriber's purpose. I wish every optician could and would follow Phillip's scientific statements as a guide, and no working ophthalmologist can afford to be without the knowledge he can find here. To be sure the practitioner in large cities generally depends on trained opticians—as they should—but away from their habit at the mercy of college (!) graduates and jewelers—however so honest—the ophthalmologist must be his own optician or suffer, and Phillips should come to his rescue.

A. B. HALE.

Physician's Visiting List, 1903.

Regular edition. 25 patients per day or week, price \$1.00. P. Blackiston's Son & Co., Philadelphia.

The fifty-second year of its publication shows this dear little volume more welcome than ever. I didn't begin using it at the time of its birth, nor do I hope to see its demise, but we are now grown

inseparable companions, and I hope I may revive my youth with the freshness and vigor it shows. The dose list and tables for ready reference are very serviceable and I have found no way of keeping a uniform day book that has given me equal satisfaction. There are this year two new features—incompatibility (ehemie, pharmaceutic and therapeutic), and immediate treatment of poisoning.

A. B. HALE.

Medical Microscopy.

Designed for Students in Laboratory Work and for Practitioners.

By T. E. Oertel, M. D., professor of histology and clinical microscopy. Medical Department, University of Georgia. Svo 62 pages: 131 illustrations (some colored), Philadelphia. P. Blakiston's Son & Co. 1902. Price, \$2.00, net.

As the preface and title page say, the book is for students, and especially for those practitioners who wish to acquire a working knowledge of medical uses of the microscope chiefly for clinical purposes; and, therefore, it is not surprising that the contents run from Microscope through Preparation of Tissue, Bacteria, Bacteriologic Methods, Staining, Pathogenic Bacteria, Tumors, Blood, Urine, Semen, Secretions and Feces. It is the pathology of the bedside, as seen under the microscope.

Some teachers advise their students to purchase an exhaustive text book of any one subject in order to be able to control it in all its ramifications; some students, on the other hand, prefer a small book with many subjects or, perhaps, many small books, as allowing a bird's-eye view until they are ready to sweep into the valley, where detailed knowledge is to be found. I rather incline toward the latter scheme, and the book before me is a novelty, in that it embraces most of what the hurried student should know, in a decently small compass. Anyone who can learn without a teacher can find much here to aid him; with a teacher who keeps clinical purposes solely in view, the book would soon become a well-thumbed manual. So much I can say heartily in its favor. I can find no fault with what it contains; fresh, and pointed, and accurate the information is. For instance, Widal's reaction is clearly explained; the various pathologic bacteria are well described, and staining methods and formulæ are practical.

Sins of omission there are, however, which must and can be corrected without much additional space. We ophthalmologists should have at least one bacillus to our credit—the Koch-Weeks—and the pneumococcus should be credited with its love for the conjunctiva. I think some mention should be made of Koch's latest controversy concerning bovine and human tubercle: it is important for the clinician. Hansen's name and his discovery should be attached to the lepra bacillus: there should be a chapter on animal parasites (body lice, especially), as the microscope must be used to classify (and sometimes to detect) them; and illustrations of the malarial parasites and of the irregular corpuscles in the anemias *must* be added, else the student has no key to the text. It is bad advice (p. 243) to

say that experience teaches that it is not necessary to sterilize the knife used for drawing blood from the ear. Experience teaches quite the contrary. Many punctures may be made by an unsterilized knife and no harm done, but nobody can tell when infection may occur and, therefore, surgical cleanliness must be preserved.

Everything else I could say of the book would be to praise it. The publisher has, as usual, done his work well, and the illustrations please the eye and aid the judgment.

A. B. HALE.

THE ANNALS OF OPHTHALMOLOGY.

VOL. XII.

JULY, 1903.

No. 3.

THE ACCOMMODATIVE ASTHENOPIA OF DONDERS.

DR. GEORGE J. BULL,

PARIS.

In his instructive book on the anomalies of accommodation and refraction of the eye, Donders describes the symptoms of an affection to which he gives the name of Accommodative Asthenopia.

“The eye,” he says,* “has a perfectly normal appearance, its movements are undisturbed, the convergence of the visual lines presents no difficulty, the power of vision is usually acute; and nevertheless in reading, writing and other close work, especially by artificial light, or in a gloomy place, the objects, after a short time, become indistinct and confused and a feeling of fatigue and tension comes on in, and especially above, the eyes, necessitating a suspension of work. The person so affected now often involuntarily closes his eyes, and rubs his hand over the forehead and eyelids. After some moments rest, he once more sees distinctly, but the same phenomena are again developed more rapidly than before. The longer the rest has lasted, the longer can he continue to work. If he is not occupied with looking at new objects, the power of vision appears to be normal, and every unpleasant feeling is entirely absent. If, on the contrary, he endeavors, notwithstanding the inconvenience which arises, by powerful exertion to continue close work, the symptoms progres-

* Donders on the Anomalies of Accommodation and Refraction of the Eye, 1864, p. 259.

sively increase, the tension above the eyes gives place to actual pain, sometimes even slight redness and a flow of tears ensue, everything is diffused before the eyes, and the patient now no longer sees at first well, even at a distance. After too long continued tension, he is obliged to refrain for a long time from any close work. It is remarkable that pain in the eyes themselves, even after continued exertion, is of rare occurrence."

Donders goes on to say that he discovered the cause of this asthenopia in the hypermetropic structure of the eye.

"Every hypermetropia," he says,* "which with reference to the range of accommodation, has attained a certain degree, is at the same time asthenopia. If the symptoms do not manifest themselves until 25 years of age, or even later, this is to be ascribed merely to the fact that previously the range of accommodation was sufficiently great, easily to overcome the existing degree of hypermetropia" * * *

"The phenomena of asthenopia," says Donders,† "proceed from nothing else than from fatigue of the muscular system of accommodation." * * * "Where hypermetropia exists,‡ such a degree of contraction is required, that increasing fatigue, at length proceeding to complete loss of energy, cannot long be absent."

Donders ends his chapter on this subject with the statement§ that "the necessity of complete relief by spectacles was proven, while at the same time the hope of a radical cure of asthenopia was extinguished forever."

The conclusion is logical; it is time to consider whether the premises are correct.

It is to be remarked in the above quoted description of the phenomena of accommodative asthenopia, that Donders says: "The convergence of the visual lines presents no difficulty." By this mark he distinguishes this kind of asthenopia from another called by von Graefe "muscular asthenopia," the characteristic feature of which is pre-

**Op. cit.*, p. 261.

†*Op. cit.*, p. 265.

‡*Op. cit.*, p. 268.

§*Op. cit.*, p. 274.

cisely a difficulty of convergence, the so-called insufficiency of the internal recti muscles.

It is obvious from Donders' writings and from our own present knowledge of the subject, that although persons who suffer from what he called accommodative asthenopia do not have insufficiency of the interni, they may have various other more or less manifest anomalies of the ocular muscles, and notably esophoria.

Donders and von Graefe, who were quite at one on this subject, recognized only the presence of esophoria in accommodative asthenopia. I shall therefore confine my remarks to cases of this kind and to simplify the comparison of the two classes of asthenopia—I shall consider only cases that occur in hypermetropia.

We find, then, in the class of accommodative asthenopia the hypermetropes who show a tendency to excessive convergence, esophoria, and, in the class of muscular asthenopia those who have a tendency to excessive divergence, exophoria.

The effect of convex glasses is different in the two; they relieve the suffering in accommodative asthenopia, and are apt to aggravate it in muscular asthenopia. It is this which led Donders to believe there was a radical difference of causation in the two classes.

The cause of muscular asthenopia is in the motor muscles of the eye; von Graefe had cured it by tenotomy. The cause of accommodative asthenopia must be elsewhere; convex glasses relieved it, and tenotomy made by von Graefe had failed.

Not many years had passed since von Helmholtz had shown the importance of the ciliary muscle in the mechanism of accommodation. Donders himself had lately discovered hypermetropia, and knowing that convex glasses, in correcting this error of refraction, lessen the excessive demand on the ciliary muscle and at the same time relieve the sensations of tension and of pain, he was led naturally to conclude that the ciliary muscle was the seat of these sensations.

This inference does not appear to me to be justified, for by reason of the connection between accommodation and convergence, convex glasses in lessening the contraction of the ciliary muscle diminish also the tension of

the internal recti. Before admitting that the seat of pain is in the ciliary muscle, as Donders thought, we should consider if it is not rather in the motor muscles of the eye.

It is commonly taught, even in our own day, that the tension of the ciliary muscle in hypermetropia is like that of the muscles of the leg of a person who stands for a length of time on tip-toe to look over a wall.

The comparison is hardly just. In this example the state of tension is constant, but in the eye it varies at every moment. Nature has made ample provision for the work of accommodation, and the most difficult tasks do not prevent the incessant changes of contraction of the ciliary muscle which are necessary for its normal function.

In the affection known as spasm of accommodation, we might be disposed to attribute the suffering to contraction of the ciliary muscle; but pain is not always present, and when it exists we may properly inquire if it be not rather in the motor muscles. In all cases of spasm that I have examined I have found anomalies of the external muscles.

The use of belladonna puts the ciliary muscle at rest, and yet does not relieve all cases of so-called accommodative asthenopia. Even when the drug gives relief it does not follow that the ciliary muscle was the seat of pain, for, as we observe in cases of convergent strabismus, paralysis of the accommodation by belladonna is accompanied by marked changes in the tension of the internal recti.

It is true that painful sensations are more common in hypermetropia than in myopia, and this would appear to justify the assertion that the disposition to asthenopia is proportional to the degree of available accommodation; but on the other hand many well known facts seem to controvert this opinion. Asthenopia is absent in many cases of hypermetropia of high degree, and is frequently present in cases of low degree. The disposition to asthenopia is also more common in young hypermetropes than in older ones, and persons who have suffered in their youth, often have no suffering in later years, although their hypermetropia has not been corrected by glasses.

The advent of asthenopia seems to depend more on other circumstances than on the diminution of accommo-

dation produced by age. Von Graefe himself says that he suffered from accommodative asthenopia after a severe illness; but he admits that his amplitude of accommodation had not changed.

A serious objection should be made to Donder's statement that "every hypermetropia which, with reference to the range of accommodation has attained a certain degree, is at the same time asthenopia." This is, in fact, the necessary consequence of the theory that asthenopia is due to an insufficiency of accommodation, but as the above quoted assertion is not confirmed by experience, we are justified in calling the theory in question.

My confrères must have remarked, as I have, that many hypermetropes never suffer from asthenopia.

For my part I am disposed to go farther, for I believe that sensations of tension and pain are not symptoms of uncomplicated hypermetropia.

Among the complications commonly met with in cases of hypermetropia are certain anomalies of the recti muscles.

What reasons have we for believing that the motor muscles of the eye are the seat of sensations of tension and pain?

In the muscular asthenopia described by von Graefe the patient does not commonly appear to squint, although the screen test shows a tendency of his eyes to deviate outward. He is often dimly conscious that he has a difficulty in using the eyes together. He tells us he must pay close attention in order to see things properly; and, on our part, we may observe when he is distracted in conversation one eye is apt to deviate outward. It is obvious that this tendency to outward deviation, exophoria, is habitually overcome by an effort which puts the ocular muscles, and chiefly the interni, in a state of relatively high tension. An abnormal state of tension is in fact necessary for the maintenance of binocular single vision.

The patient's efforts may make it difficult for us to find evidence of his fault. The phorometer in cases of exophoria will sometimes indicate the opposite error, namely, esophoria; for the check given by fusion being withdrawn by the prisms of the instrument, the eyes may deviate momentarily inward, thus showing the tension maintained

by the interni in order to overcome the forces that cause the outward deviation. For the same reason the phorometer often gives no sign of exophoria even in cases of periodical divergent squint.

We have further evidence of a state of exaggerated tension in the pain that comes behind or around the eyes. The patient describes it as a drawing sensation, a muscular pain or cramp. The nature of the pain and the position to which it is referred, naturally lead one to look for its cause in the recti.

Various circumstances may bring on the pain and increase it, for example the prolonged fixation of an object held too near the eyes or far to one side. By analysis of these different causes of suffering, we find that they have this in common, namely, they increase the tension of the motor muscles of the eyes.

On the other hand we find that a remedy which lessens the exaggerated tension of the muscles relieves the pain. Tenotomy proves this beyond question.

The term muscular asthenopia given to this condition has been well chosen; there can be no doubt that the fault is in the motor muscles.

By analogy we may expect to find a like cause in accommodative asthenopia. As a matter of fact, the symptoms of the two affections are almost identical, and in both, anomalies of the muscles of convergence are to be found.

Donders was aware that a tendency to excessive convergence, esophoria, is commonly present in cases of hypermetropia, he stated* that the screen-test will show esophoria in almost every hypermetrope. Yet, it did not occur to him that the motor muscles may cause the suffering in the so-called accommodative asthenopia.

He treated the question only from the point of view of the accommodation. Thus, in speaking of the relative range of accommodation, he describes the curves as divided by the diagonal (line of convergences) into two parts, *one above the other*; the one he calls the positive part of the relative range of accommodation, and the other the negative part. According to Donders,† “the accommo-

*Op. Cit., p. 294, 295.

†Op .cit., p. 114.

dation can be maintained only for a distance, at which, in reference to the negative, the positive part of the relative range of accommodation is tolerably great."

It seems to me more practical to consider the question from the point of view of the convergence, and to speak of the curves as divided by the diagonal into two *lateral* portions; on the one side the positive part of the relative range of *convergence*, and, on the other, the negative part.

The Holmes* stereoscope enables us to determine the curves of the relative range of convergence, and to study the causes of fatigue. The instrument is convenient for our purpose, for by moving the test cards nearer or farther away we change the demands on the patient's accommodation, and by using cards the two test discs of which are more or less widely separated we change the demands on his powers of convergence.

When we use a card with the discs separated by such an interval that the patient may fuse the images by a *moderate* effort of convergence, we may observe the effect produced on the accommodation by increasing or diminishing the distance of the card. When the card passes beyond the *pr* of accommodation the patient is made artificially myopic, and, like the myope, is not fatigued by the indistinctness of the images. If, on the other hand, we bring the test card nearer, passing through the range of accommodation, the positive part of the relative range of accommodation becomes less and less in reference to the negative, but the patient sees distinctly up to the extreme limit of his range. And, when we bring the card nearer than his *pp*, the patient becomes artificially presbyopic, and, like the presbyope, is not fatigued by the fixation of the blurred images. By many experiments of this kind, I have observed that fatigue is not commonly produced by simple efforts of accommodation and bears no direct relation to the degree of accommodation that is in reserve.

But if fatigue is produced by this series of experiments, in which only a moderate degree of convergence has been maintained, it will be found to occur in another series, in which an *excessive* effort of convergence is required.

For this purpose I make use of test cards with the two

*Vide "La Convergence Relative:" Bulletin de la Société Française d'Ophthalmologie, XVIII, p. 414.

discs very close together or very wide apart. Test objects very close together enable us to measure the positive part of the relative range of convergence; and to maintain fusion here the patient finds a certain difficulty similar to that felt in cases of insufficiency of the interni (exophoria).

On the other hand, test-discs separated by a wide interspace serve to determine the negative part of the relative range of convergence, toward the limit of which fusion is difficult, and is maintained only by an effort like that which characterizes esophoria.

The important point brought out by these experiments is that the difficulty of keeping the test images fused shows itself by sensations of tension and pain, as well in the positive as in the negative part of the relative range of convergence, and more especially toward the extreme limits of these parts.

In this series of tests the accommodation is in play as well as the convergence; by moving the cards farther from the patient, and by bringing them nearer, we may make all desired changes in the demand of the two functions. If we wish to eliminate the combination altogether we may also paralyze the ciliary muscle by belladonna, and we shall still find that excessive efforts of convergence, positive or negative, cause tension and pain in sensitive subjects.

By analysis of the difficulties experienced by patients under these varying circumstances, I have come to the conclusion that fatigue and pain are the consequence of efforts of convergence, and that the accommodation acts only indirectly.

In studying the curves of the relative range of convergence I observe that convergence can be maintained without fatigue only when the diagonal (line of convergences) is well within the limits of the curve, that is to say, when both the negative and positive parts of the relative range of convergence have a certain value.

It is in cases of orthophoria that we find the ideal curves. In esophoria, on the contrary, the curves show a characteristic defect; the negative part of the relative range of convergence is narrow, the narrowness increasing toward the pp ; so that the curve which limits this part of the

range makes a wide angle with the vertical and rapidly approaches the diagonal.

The stereoscope aids us to find the cause of the difficulty. For example: The young subject who has no error of convergence finds no difficulty in maintaining a convergence of 1 or 2 metric angles and in accommodating, at the same time, 4 or 5 dioptries; but a patient of the same age who, by reason of esophoria, suffers from asthenopia will find this impossible. He will be able, however, to accommodate much more if he be allowed to converge more. It is not the accommodation, but the convergence, that is at fault; the degree of accommodation required obliges him to make an excessive effort of convergence. The unsteadiness of the images of the discs, their overlapping, their going apart and coming together again, show a fault of fixation, a difficulty in maintaining the required degree of convergence.

The struggle between the internal recti and their antagonists is clearly shown by this test. It is to be observed, also, that at the moment when the stereoscope gives us this proof of the difficulty of convergence, the patient is apt to complain of fatigue and pain. The fibrillary contraction of certain muscles of the face, the frowning and wrinkled brow, the stiffened jaw, indicate also a state of high tension in the muscles generally, which must have its point of origin in the muscles of the eye.

Von Graefe had accepted Donders' view on the insufficiency of the ciliary muscle; nevertheless, in two cases of accommodative asthenopia, he sought to change the relation between accommodation and convergence by tenotomy of the internal recti.* His operations being unsuccessful, he concluded that the attempt was more interesting than practical.

The question having been thus decided, many years passed without any attempt being made to find elsewhere than in the ciliary muscle the cause of so-called accommodative asthenopia.

Little by little, however, the importance of the anomalies of the motor muscles of the eye came to be understood. Without calling in question the truth of Donders' teaching, certain specialists, Stephens, Noyes, Risley and others,

†Archiv. f. Ophthalmologie, VIII, 2, p. 321.

gave relief by tenotomy of the internal recti to cases which Donders would have called accommodative asthenopia.

The greater number of cases of this asthenopia are easily relieved by convex glasses, through the lessening of the innervation of the internal recti muscles; others are cured by glasses which facilitate in various ways the fusion of images; but certain cases are not relieved by glasses and it is here precisely that surgical treatment finds its justification.

The number of cases cured by tenotomy of the internal recti is so great that we can no longer doubt that the cause of the trouble is in these muscles.

To simplify the subject I have spoken only of cases of esophoria; but my observations apply also to other anomalies of the ocular muscles. Hyperphoria as well as esophoria is found in so-called accommodative asthenopia and it is observed that these muscular errors sometimes disappear when the refractive error is corrected by glasses. The cases of asthenopia that find the most certain relief through convex glasses occur in hypermetropes who have no other muscular anomaly than esophoria. The most remarkable benefit by glasses is sometimes obtained when the hypermetropia is of low degree.

These facts cannot be explained on the hypothesis of insufficiency of accommodation, but are easily understood if we admit that by derangement of the function of the motor muscles of the eye, a slight error of refraction may interfere with the maintenance of binocular single vision.

There are certain test cases in which errors of refraction, different in two eyes, seem to be the only cause of suffering. In these cases badly chosen glasses increase the distress; other glasses by the perfection of their correction and by the comparative relief they procure seem to become indispensable. Nevertheless, if we correct the insufficiency of the muscles by a surgical operation the relief is still more complete and glasses may be dispensed with. In these cases at least the cause of the trouble is a difficulty of convergence.

The question is not without interest from a practical point of view, for if we assume that the suffering in errors of refraction is caused not so much by fatigue of the ciliary muscle as by irregular and disordered tension of the

motor muscles of the eye, we are obliged to formulate new rules for the prescription of glasses.

On this subject I am not in accord with Donders and his school. In all questions that treat of the relations between accommodation and convergence, Donders attributes the defect to an error of accommodation. I consider it as due principally to a fault of convergence.

Not accepting his data I cannot admit his conclusion that to obtain complete relief the use of glasses is necessary.

Neither do I admit that "the hope of a radical cure of asthenopia is extinguished forever."

Ordinarily the symptoms of this disorder are manifested in series, the consequence of over-work or of the general depression caused by illness. Rest and treatment of the general health, with the temporary use of glasses, will generally suffice to relieve the state of hypertension upon which the suffering depends. In certain cases glasses must be worn permanently, but in others an operation which regulates the accord between accommodation and convergence makes a radical cure.

If the direct cause of so-called accommodative asthenopia is in the motor muscles, and not in the ciliary muscle, we may ask whether the name of accommodative asthenopia should be maintained, and whether the term muscular asthenopia should be applied only to cases of insufficiency of the internal recti.

WHY NOT EMPLOY INTRA-CAPSULAR IRRIGATION IN CATARACT OPERATIONS?*

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Intra-ocular irrigation in cataract operations is not a new procedure but so little has been written about it in recent years and so few and incomplete are the references to it the recognized text books that in daring to speak of the matter here one feels almost as much trepidation as he would in introducing an absolutely new and untried modification of this important operation. Although a careful review of the literature fails to reveal any substantial criticism of the procedure or any definite proof that it is a particularly serious or dangerous proceeding to employ, it would seem that there must be some well founded and generally accepted objection to its use to have brought about such an unanimous verdict against it as we find in the writings of our authorities, or, some excellent reason to account for the cold disregard which has been accorded to it by the profession in general. It is with the hope of drawing out whatever adverse criticism we may justly make upon this measure and of securing the record of whatever reasons may exist for opposition to it that I have had the temerity to raise the question, rather than with the idea of adding anything particularly new to what is known in its favor, and, taking the stand of an enthusiastic advocate I do so primarily, to present a basis for antagonistic discussion and only secondarily, because I am inclined to believe in its great value. I wish to make it perfectly clear in the beginning that I am not advocating any great alteration in the classical cataract operation of to-day; I am really seeking information. If irrigation is a useful and helpful adjunct to our present method of

*Read before the American Ophthalmological Society, at its thirty-ninth Annual Meeting, Washington, May 14, 1903.

operating; if it improves the chances of securing a successful result; if it diminishes the probabilities of concurrent iritis, irido-cyclitis and keratitis; if it lessens the number of secondary capsular cataracts, and consequently the number of discission operations; if it only maintains our present high average of successes, but enables us to secure such success in a shorter period of time than when we do not irrigate; then, by all means, let us acknowledge these facts and endorse the measure as a legitimate proceeding and properly a part of the cataract operation for those who choose to employ it. On the other hand, if it accomplishes none of these things; if it neither facilitates a satisfactory outcome, decreases the inflammatory sequelae, nor reduces the number of secondary operations; or, if it adds materially to the operative risks and dangers; then, let us, having determined these facts, plainly state our reasons for condemning the procedure. So far as I can learn that sort of consideration has not been given to this question. In such literature as I have discovered bearing upon this subject another curious fact that also commands attention is this, that practically all of those who have employed irrigation in any number of cases, and have published their results, endorse the plan most enthusiastically, while all other writers on cataract operations either entirely ignore this measure, or condemn it with a few words and without giving any reasons for so doing; some of these latter admit that they have not tried it and others show more or less plainly that they did not give it a fair trial, that is, they used inefficient apparatus or, perhaps through fear, failed to use their apparatus properly.

While St. Yves is accredited with being the first to employ irrigation of the anterior chamber for the removal of inflammatory exudates and Guerin, Sohmer and others operating in the latter half of the eighteenth century, endeavored to promote its use for the extraction of cortical remnants it was not until 1884 that the medical world became aware of any serious effort to place this proceeding upon a satisfactory scientific footing. In that year, William A. McKeown read his first paper on "The Treatment of Immature Cataracts by Intra-ocular Injection and Irrigation," before the Ophthalmological Section of the Brit-

ish Medical Association. At that time, if not still, McKeown laid more stress upon the value of his method of injecting fluid within the lens capsule to hasten maturity of cataracts or to facilitate detachment of the cortex from the capsule, than upon intra-capsular irrigation to remove cortical remnants after the extraction of the nucleus by the ordinary means. With that part of his work I do not propose to deal at present. It would appear to be the most hazardous portion of his operation and so far as I am aware no one but its author has employed it, and, the success of irrigation without previous injection seems to render the latter an unnecessary procedure.

Judging from the discussion of McKeown's paper and the dearth of British literature upon the subject it would appear that his home confrères never followed his suggestions to any marked extent. On the Continent, however, his message was accorded a hearty reception and the method adopted by the French operators particularly. A series of very instructive and interesting papers published in the next five years by Panas, DeWecker, Grandclement, Chibret, Drausart, Terson, Wicherkiewicz and Neve. In this country the most prominent advocate of the method has been our esteemed colleague, Dr. Lippincott, who in 1891 presented to this Society a report of one hundred cases in which he had employed irrigation as a routine measure.

Interesting as it would be to discuss all the different forms of apparatus and the variety of irrigating fluids that have been employed by different operators, we must avoid that now and let it suffice, for the present, to say that experience has shown that antiseptic solutions are not only unnecessary, but prejudicial, and that normal salt solution, which approaches most nearly the natural contents of the anterior chamber, is the best irrigating fluid, while, as to the apparatus, McKeown's tips connected by rubber tubing with a glass irrigating bottle so that the flow is obtained by gravity and regulated at the junction of the tubing with the tip by the fingers of the operator, are the most simple and generally useful form.

Before entering upon a discussion of the advantages and disadvantages of intra-ocular irrigation it would certainly be advisable to consider what we mean by that

term and to set forth very clearly the method of procedure that we desire discussed. Even a very cursory investigation will disclose the fact that the term "irrigation," as used in connection with cataract operations, has been very much abused. Ask a number of your friends whether they have ever employed irrigation of the anterior chamber for the removal of the cortical substance remaining after extraction of the lens nucleus. Of those who reply in the affirmative, one will tell you that he has done so with an ordinary pipette, or medicine dropper; another, that he used the small pipette attached to a large rubber hand bulb capable of holding perhaps 50 cc. of fluid; and a third, that he employed the irrigation bottle, with either the simple gravity tube or the pump arrangement, and the glass pipette for a nozzle, but that he never dared introduce the nozzle deep into the anterior chamber, contenting himself with playing a stream upon the sclerotic margin of the wound and hoping that the resulting depression would permit sufficient ingress of water to wash out some of the cortex. Now it is questionable whether any of these operators has really irrigated the anterior chamber, certainly they have not irrigated the posterior chamber. If irrigation means anything it means thoroughly flushing with a quantity of fluid which, in proportion to the size of the chamber to be irrigated, is greatly in excess of what could possibly be introduced by the means described. Certainly the injection of a few drops of fluid with the small pipette does not constitute irrigation in the sense in which we generally use that word. Nor has it ever been claimed by anyone that the great benefits attributed to intra-ocular irrigation could be obtained by such measures and a protest might well be entered that it is unfair to condemn the operation of irrigation upon the unsuccessful and unsatisfactory results that must follow such inefficient performances. A few attempts in the course of cataract operations, or a few experiments upon animals will convince anyone of the utter futility of trying to cleanse the anterior chamber and intra-capsular spaces of cortex by these injections. In fact, even with the proper apparatus it often requires a large quantity of fluid, sometimes as much as 200 cc., and a great deal of force to dislodge the sticky remnants and I have seen some particles that

could only be removed by bringing the nozzle tip directly in contact with them. I surmise that it is just these weak attempts or the lack of proper apparatus that has lead to discontent with this measure, while the theoretical objections to it have prevented many from trying it at all

I can perhaps explain my own idea of what constitutes proper irrigation in cataract operations by describing the apparatus and the method that I personally employ. The McKeown tips seem to me to be the most satisfactory, yet it is perfectly possible to do good work with the ordinary medicine dropper used as a nozzle, if it be slightly modified—that is, if the tip be given a curve to make it easier of introduction into the eye without touching the brow, and the point be flattened so as to produce a broad, thin stream. Glass tubes are, however, so easily broken in the course of sterilization that they may present an unobserved rough edge and are therefore not equal to the metal tips. A Florence flask that has an outlet at the bottom, or, better still, a graduated bottle such as is used for intra-venous salt injections, is the best form of container for the irrigating fluid, and the nozzle is connected with this by several feet of soft red or black rubber tubing; no intervening pump or syringe is necessary, for by elevating the reservoir from 12 to 18 inches above the head of the patient all the force necessary to be communicated to the flowing liquid will be secured by gravity. A clamp should be placed on some part of the rubber tubing to prevent escape of the solution until the surgeon desires it, but after once operating this the control of the flow rests with the operator whose fingers compress the tubing over the flange at the proximal end of the nozzle. By doing away with the pump or syringe and utilizing the power of gravity we are enabled to do without an assistant to manipulate the apparatus. The reservoir may be supported by an upright retort holder, standing near or attached to the end, or the nurse or assistant may hold it at the proper height, *but the operator's hand and brain should alone control the irrigation, sharing the responsibility with no one.*

The preparation of patient and surgeon for the operation differs in no respect from the well recognized rules in vogue to-day by all who practice aseptic surgery. The instruments, including the nozzle tips, are carefully steril-

ized, in accordance with the custom of the surgeon, and the irrigation reservoir with the rubber tubing and the proximal end of the nozzle (if McKeown's be used) are boiled together. The irrigating fluid, preferably a normal salt solution, is boiled in a separate Florence flask and allowed to cool down to about 37° C. before transferring to the reservoir, a proceeding which is to be attended to by the nurse just before the surgeon begins to operate and when everything else is in readiness. The operation is performed in the usual way according to the predilections of the individual, up to and including expulsion of the nucleus. It matters not whether the simple or combined extraction be performed, irrigation is applicable to either, but it would seem less difficult to secure complete evacuation of all cortical substance where an iridectomy is done. Now, instead of stroking the cornea or using the scoop, a nozzle tip is fitted to the apparatus and the solution allowed to flow for a moment to determine whether everything is working properly and to displace from the tubing that fluid which has become cooled. Letting the solution flow but gently at first, it is well to allow it to run over the eyeball for a few seconds to remove any particles of cortex or blood that may be present and to accustom the patient to the sensation, or at least to ascertain how he is likely to behave under the treatment. While the solution flows gently, the tip is introduced between the lips of the wound and, gradually increasing the force of the flow, is advanced well into the anterior chamber and moved about so that the stream is made to penetrate every hiding place in front of and behind the iris and within the torn capsule. With a quiet patient the point may be safely conducted behind the iris in the deepest part of the posterior chamber.

Good illumination of the cornea during this process is desirable, and if sufficient light cannot be obtained from the window an electric head-light may be worn by the operator, or some form of portable light can be arranged to illuminate the field of operation. Irrigation should be continued as long as any particles of cortex or hemorrhage may be seen within the eye and the globe is then thoroughly washed as the tube is withdrawn. The

operation is then completed and dressings are applied in the usual way.

It may very properly be asked at once, why should we modify the present classical cataract operation in any way, is it not about as simple and safe as it can be made, and are not our results very satisfactory? It is true that as regards ease and simplicity of operating the present methods can hardly be improved upon, but I think it can be shown that the suggested modification does not lessen the safety of the cataract operation and that it does procure more satisfactory results. Leaving out of consideration, for the moment, the possibilities it affords of operating upon immature cataracts, with all that means in the saving of time, expense, and suffering for the patient who is waiting for a cataract to ripen, and confining our attention to mature senile cataracts, who has not been disappointed to find upon post-operative inspection, after a perfectly smooth operation where all the cortex seemed to have been removed by the aid of spatula or scoop, that a mass of cloudy, cortical substance partially or completely occluded the pupillary area? The disappointment is not only to the surgeon, who knows that as a rule absorption of such masses will occur in time, but the patient, who has been lead to expect immediate improvement in vision, finds it hard to believe during the next few weeks that his sight will ever be restored: Unfortunately, too, these masses do sometimes become organized and give both surgeon and patient an endless amount of trouble. Nor is the mere presence of cortex, acting as mechanical obstruction to the visual axis, the only obstacle to a good result. It will be generally admitted that such cortical masses, through their action as a foreign body, tend to produce inflammation of the iris or ciliary body and to excite an active proliferation of the cells lining the posterior capsule, with the consequent production of secondary cataracts. In this connection Dr. Randolph's excellent thesis on the regeneration of the lens is worthy of study.

It will be remembered that he found regeneration of the lens always more rapid and complete when iritis followed the primary extraction and that he believed the factors which tended to the formation of a new lens, to be "the

hypertrophy of the lens fibres which had been left after the operation the continued development of the cells of the nuclear zone."

But aside from the disadvantage of more or less prolonged period of absorption, of the consequent disappointment and delay, of the necessity of dosing the patient with drugs calculated to promote absorption, it should be sufficient argument for instituting some change, to say that we all *acknowledge* the necessity therefore in our *strenuous efforts to get rid of this cortical matter* and, furthermore, it may be said, that in following our present habit of leaving this substance to be absorbed by nature, we instance the *only surgical procedure that is knowingly and regularly abandoned in an incomplete stage*.

What are the advantages of intra-capsular irrigation? It is claimed by McKeown and others that it will remove every particle of the lens from its capsule at the time of operation; that it completes the toilet of the wound as it can be accomplished in no other way; that it re-establish the anterior chamber and causes the iris to resume its proper position, even where a tendency to prolapse has shown itself in the earlier part of the operation; that there are fewer cases of iritis or irido-cyclitis after its use than after operations in which it has not been employed; and, that it greatly diminishes the number of cases calling for discission of secondary capsular cataracts. As against this one may array as possible disadvantages, the lengthening of an operation upon delicate structures; the danger of introducing another instrument into the eye; the risk of losing vitreous humor; and, the doubt as to whether ultimate results will be improved by its use.

Concerning the possibilities of the complete removal of cortex, McKeown's graphic illustrations* will serve beautifully to demonstrate why the ordinary measures employed for this purpose fail and how irrigation succeeds. It is a simple, mechanical proposition met and overcome by the simplest and safest mechanical means. When the cortical masses are caught and held at the equator by the inverted elastic margins of the torn anterior capsule, stroking of the cornea serves to imprison them the closer

*McKeown's "Unripe cataracts," Plate 1 figs. 4 and 5.

and cannot dislodge anything more than what happens to be free in the anterior chamber, whereas, an active stream of water can be made to permeate every corner and to flow in and out behind the curled up capsule, washing out all loose fragment before it. If our object is to remove the entire cataractous lens and to leave nature the task only of healing the corneal wound, this measure accomplishes it, for I take it there can scarcely be any doubt that it performs a satisfactory toilet of the wound. The promptness with which the iris retracts is one of the prettiest features of the operation and continuence of the irrigation never causes any tendency to prolapse. Operation upon the capsule for secondary cataract is required in only about 10 per cent. of the cases in which irrigation has been employed. As to the frequency of iritis or cyclitis, it would be manifestly impossible to give any conclusive statistics on that point, since the opportunities for differences of personal equation are too great.

The duration of a cataract operation is hardly worth considering. While it is desirable that no operation should be continued a moment longer than is actually necessary to secure a good result, it is equally plain that no sacrifice should be made to undue haste and the shortening of time at the expense of leaving the work half done is a costly gain. As for the danger of introducing an extra instrument into the eye, in what respect is it more dangerous to introduce an irrigating nozzle than a scoop or a cystotome? If all the instruments employed be absolutely sterile it makes little difference whether you use four or three.

In a very excellent monograph on the treatment of Immature Cataracts, published in 1898, McKeown has given his reasons for each of the above assertions and his answer to each of the objections. He gives us the detailed reports of one hundred and forty-six cases in which irrigation was performed, with the immediate complete removal of all cortex in 123 and a slight amount left in the other 23, in the majority of which, for one reason or another, the irrigation could not be continued as long as he wished. In this series of 146 cases, representing all kinds of cataracts, from congenital posterior polar to immature senile, four eyes were lost; one by sepsis, two by uveitis and one by prolapse of the iris, but neither of the

losses could be clearly attributed to the irrigation. This is a very good showing, especially when considered in connection with the evidence that in all the other cases good visual results were obtained and, later, section of the capsule was performed, or noted as necessary, in but fourteen.

Lippincott in his report of 100 cases had but three losses; two by panophthalmitis and one by occlusion of the pupil, if the latter may be called a loss; very good visual results in the other cases and only 11 secondary operations.

In the face of such publications as are coming from India where one surgeon operates on as many as fifty-three cataracts in one day, and another on forty-four on each of two successive days, an American ophthalmologist, and especially one of the younger set, feels a delicacy about quoting figures from his own practice. I think it is only fair, however, that I should be expected to append my own experience with this operation, however small it may have been. I have now used irrigation in twenty cases and with the most gratifying results. These may be briefly stated as follows: No losses; complete removal of the cortex in 18 and some remnants left in two; but two instances of any marked degree of iritis; good vision in every case, and so far but two have required operation upon the capsule, though some of my cases are very recent.

To judge any operation upon a small number of cases would be very unwise, but if we make a composite study of all the recorded operations of this kind by the various operators, I think we shall have to admit that the results are better than can be shown for the same operations done without irrigation. Time does not permit me to go into any more elaborate argument, and as my experience with the operation and satisfaction with its results are very thoroughly in accord with the opinions of Dr McKeown, I could not do better than to present for your consideration now the conclusions that he gave, insofar as they refer to the more limited class of cases we have been speaking of. They are:

- (1) That the introduction within the eye of the sterilized saline solution is harmless.

- (2) That the removal of cortex is a mechanical process and regulated by ordinary physical laws.

(3) That, from the anatomical structure of the eye, and the conditions existing during the operation, irrigation is more efficient in removing cortex than any other method.

(4) That just as irrigation removes cortex, so it removes blood and bubbles of air. It also shows the condition of the capsule, gives tone to and replaces the iris and is effectual in making the toilet of the wound.

(5) That the very free irrigation by the nozzles may be practised without fear.

(6) The irrigation does not tend to cause prolapse of the vitreous.

(7) That the secondary operations form a small percentage.

A CASE OF TUBERCULOSIS OF THE CONJUNCTIVA; RECOVERY WITHOUT LOCAL INTERFERENCE.*

F. L. HENDERSON, M. D.

ST. LOUIS, MO.

Norris says: "Tuberculosis of the conjunctiva, always a rare disease, is seldom seen in this country." Thompson, of Kansas City, in his excellent work on the Conjunctiva, says: "I have never seen a case which has proved to be tubercular by bacterial investigation." When 41,730 eye cases had been treated in the Baltimore Eye, Ear and Throat Charity Hospital, not one case of conjunctival tuberculosis had been recorded. Mooren did not find tuberculosis of the conjunctiva in 100,000 cases of eye diseases. Mules estimated the proportion of cases of conjunctival tuberculosis to other eye diseases as one in 30,000. Hirschberg gives the proportion as one in 6,000 and Eyre reports from Guy's Hospital eight in 25,000 cases. There is little doubt that the disease is much less frequent in this country than in Europe. Having had two cases, each representing a distinct type of the disease, I feel justified in appropriating a few minutes of the valuable time of this Association.

Tuberculosis of the chorioid was described anatomically by Autenreith in 1808. Seventy-five years ago McKenzie of Glasgow described tuberculosis of the eye. In 1874 Koester first published a case of primary tuberculosis of the conjunctiva. In 1881 Hirschberg presented a case of tuberculosis of the conjunctiva to the International Congress. Since then numerous reports of similiar cases have been made. Haight, before the British Congress, on tuberculosis, July 26th, 1901, reported that he had collected 57 published cases of conjunctival tuberculosis. Bordley, in March, 1902, reports having collected 84 cases in literature since 1870.

*Read before the Missouri State Medical Association, April 23rd, 1903.

I believe there are but two ways of establishing a positive diagnosis of this condition.

First: By finding the tubercle bacillus in the suspected tissue and

Second: By inoculation of a lower animal. In the second method care must be observed to use an animal free from tuberculosis at the time of inoculation and to see that the animal does not contract tuberculosis from any source other than the inoculation. Koch discovered the tubercle bacillus in 1882. Therefore these methods could not have been applied before that date, and all cases reported before then are open to some suspicion. This suspicion also attaches to all later cases in which the diagnosis was based only upon clinical evidences.

In 1891 Sattler classified tuberculosis of the conjunctiva as follows:

1. Characterized by the presence of small miliary ulcers, which later on may coalesce, generally attacking the palpebral, but sometimes affecting the bulbar conjunctiva.

2. Characterized by the presence of grayish or yellow sub-conjunctival nodules, varying in size but rarely larger than a hemp-seed, not unlike the sago granules of trachoma.

3. Characterized by the presence of florid hypertrophied papillae and rounded outgrowths of granulation tissue, springing from the palpebral conjunctiva, or situated in the fornices, and which soon recur after removal (resembling in many respects the velvety granulations present in a tuberculous arthritis). These granulations are accompanied by edema and thickening of the lids.

4. "Lupus" of the conjunctiva, characterized by numerous pedunculated cockscomb-like excrescences in the fornices, of a jelly-like consistency, often showing more or less extensive ulceration.

5. To the above four groups one more should be added, in order to embrace those cases which are characterized by the existence of distinctively pedunculated tumors, having the macroscopic appearance of ordinary papillomata, and also such as those designated by Mitvalsky, as "true polypus of the conjunctiva," cases in which there is no involvement of the subconjunctival tissue, nor

the production of any subjective symptom other than slight inconvenience due to purely mechanic causes.

My first case reported in the *American Journal of Ophthalmology*, October, 1899, was of the nature described in the first group.

Fuchs, de Schweinitz, Noyes, Norris and Oliver, all agree that the disease occurs almost without exception in young subjects. Eyre, in his report to the Ophthalmological Society of the United Kingdom, in 1897, says: "The youngest case recorded is that of an infant of ten months; the oldest a man of thirty years. The majority of the cases occur, however, between the ages of ten and twenty, and are especially noticeable at puberty." In the 84 cases collected by Bordley the age varies from 8 months to 62 years. My first case was in a patient 56 years old. The case which I now desire to report is typical of group number two of Sattler's classification. According to Bordley, there have been but twenty similar cases reported up to March, 1902.

On the 28th day of March, 1901, Miss E. H., age 20, was brought to my office by Dr. M. E. Bradley. Examination showed a peculiar swelling of the right lower lid. The swelling measured 35 millimeters in length and 15 in width at the widest part. The conjunctival surface presented the appearance of an exaggerated case of follicular ophthalmia, except that the follicles seemed to extend deeper into the subconjunctival tissues. The skin of the lid was dry, scaly, thin and bluish in color. It had a distinct nodular feeling under the finger and a granular or nodular condition of the sub-cutaneous tissues was quite evident to the eye. There was a large, swollen pre-auricular gland on the right side, and numerous enlarged cervical glands on the same side. The right tonsil was three times its normal size. Patient stated that she had caught a severe cold nine weeks before (about Jan. 11th), at which time she coughed freely for a week. At the same time she noticed the swelling of the lid and the enlargement of the pre-auricular gland. It was impossible for her to say which came first, or whether these symptoms preceded or followed the onset of the "bad cold." She had lost about ten pounds since the trouble began, and now coughs in the

morning when she first gets up, and also raises some phlegm. The family history was negative, except that her father's mother and one of her father's sisters had died with cancer, and that another one of her father's sisters had lately been operated on for cancer. The patient herself had been exceedingly fat up to the age of puberty, but is now well proportioned. The eye had been treated by several physicians, all of whom declared it to be trachoma, and one had operated with Knapp's roller forceps. In spite of their treatment the tumefaction slowly increased. My diagnosis was tubercular conjunctivitis. On the following day I had Dr. Carl Fisch see the case with me, and under strict asepsis excised for him a large piece from the thickest part of the lid. The tissue was very tough and



Fig. I.

was apparently granular from the skin through to the conjunctiva. To compare the appearance of the tissue with a shad roe would be only a slight exaggeration. Dr. Fisch was also given a sample of the morning sputum. Fig. 1 is from a photograph taken five days after the piece was excised for Dr. Fisch. A scab has formed over the site of the excision. At the time the photograph was taken the width of the swelling was but 12 millimetres, the contraction following the excision of a large piece having caused the shrinkage of 3 millimetres. On April 3rd I received the following report from Dr. Fisch:

"The piece of indurated tissue excised by you from the outer border of the lower right eyelid of Miss E. H. has proved on microscopic examination to be of tuberculous nature. Besides the typical structure of tuberculous

granulation tissue a small number of tubercle bacilli could be demonstrated. The sputum of the patient contains a small quantity of tubercle bacilli. It is decidedly to the greater part of bronchial origin, partly pharyngeal. Its character is muco-purulent. No elastic tissue could be found, no alveolar cells present. As an important point I mention the absence of mixed infection in the thoroughly washed nummuli. The process seems to be of recent origin."

The pre-auricular gland was removed by Dr. Keiffer, and a physical examination of the chest gave a suspicion of lung complication, but was not at all conclusive. On April 16th I excised a piece of the lid 5 millimeters wide by 12 millimeters long, and sent it to Dr. T. Casper Gilchrist of Johns Hopkins Hospital, who made the following reports:

May 17th, 1901.

"I have examined the specimen you sent me and the characteristic features it presents are those of tuberculosis, although I have not as yet demonstrated the presence of tubercle bacilli. There are numerous beautiful areas of caseation and I expect to find tubercle bacilli in these."

June 2nd, 1901.

"I have been over the sections again and have made comparisons with similar looking sections which I have in my collection. I could show you sections exhibiting characteristics which one could hardly distinguish from your case, but in the former are large numbers of protozoa present, which are not certainly present in your case. The protozoa sections belong to a case which was reported by Dr. Rixford and myself in the John Hopkins reports, Vol. I. The characteristic feature of this protozoic infection of the skin and other organs was the formation of what looked like typical tubercles; only instead of tubercle bacilli being present, their place was taken by protozoa. There are no such organisms present in your case. With reference to syphilis—the lesions produced by this disease are in all the eruptions except gummata, quite distinct from tuberculosis. But in gummata, especially miliary gummata, there is a great similarity to tuberculosis. I have many sections of gummata

which Prof. Councilman of Harvard took to be tuberculosis. That is the reason why I asked you in my letter whether you had excluded syphilis. The sections of your case then, as I wrote you in my first letter show lesions which are typical of tuberculosis and especially in the presence of caseous nodules. I would therefore expect to find tubercle bacilli easily in the sections, and I have not done so. This may be due to the fixing in formal. In summing up:

1. Your sections show lesions typical of tuberculosis of the skin, especially as regards the presence of caseous nodules in the corium but no tubercle bacilli were found.

2. Your sections are similar to the skin lesions (ulcerative form only) of protozoic dermatitis, but in this disease pseudo-tubercles are found, and especially caseous nodules. There are no protozoa or blastomyces in your sections.

3. Syphilis is to be considered because sections of gum-mata assume characteristics like tuberculosis of the skin. But there is no history of syphilis in your case. Your case is then, by exclusion, one of tuberculosis, and I feel sure the tubercle bacilli can be demonstrated in the tissue."

Syphilis had been excluded by me owing to the absence of any such history and because patient had taken a course of mercury and iodide from the physician who preceded me in the case. During the medication the tumefaction slowly increased in size.

On May 22nd, a small piece of tissue from the conjunctival surface of lid was given to Dr. Waldron, of the Jno. T. Milliken & Co. Laboratory, for the purpose of inoculating a guinea pig, and on July 9th, the following report was received:

"I herewith submit the following report of the bacteriological examination made by me of the suspected case of tuberculosis treated by you.

Specimen tubercle was taken from the eyelid of the patient, Miss E. H., on May 22nd, 1901; the specimen was transferred to a sterile bottle and carried to the laboratory. Two hours later it was inoculated into the guinea pig. This was done by making a small pocket in the subcutaneous tissues of the abdomen and placing the suspected

tubercle in this pocket. This wound was then closed with collodion and the pig placed in a cage where it could be watched. At the time of the operation the pig weighed 508 grams.

On May 29th, weight 515 grams and there appeared at the point of inoculation a large induration which increased in size until the time of the pig's death.

On June 19th, the pig weighed 500 grams, and there was an increase of the inguinal glands. On July 6th the pig died, at which time its weight was 465 grams. On autopsy the guinea pig showed typical tubercles in the lungs and liver, these being more pronounced in the liver than in the lungs. At the point of inoculation there was a large



Fig. II.

induration and some pus. Specimens of this pus, when examined microscopically, revealed the presence of the tubercle bacillus in great numbers, and was practically free from all other organisms; this of itself is positive evidence that the case was of tuberculous nature and is perfectly confirmatory of other evidence in your possession."

My original diagnosis was now confirmed. The methods of dealing with local tuberculosis all contemplate a complete destruction of the diseased part by knife, caustics or curette. To have carried out this method of treatment in the present case would have necessitated the removal of the lower lid from the inner to the outer canthus, and from the inferior orbital rim to the lashes. I could not reconcile myself to such mutilation of a young

girl, and therefore advised an immediate and diligent constitutional treatment. She was sent at once to Colorado and has been upon beechwood creosote, guaiacol and other routine methods of medication, and has steadily improved. The cough has disappeared, likewise the bacilli from her sputum, she has gained in weight, and with the gradual improvement in her general condition has followed a commensurate decrease in the size of the tubercular lid. The photograph from which Fig. No. 2 was made, was taken March 1, 1902, at which time the patient herself and her physician both wrote that it was impossible to see any difference in her two eyes. Dr. Bradley, who brought the patient to me, saw her in August, 1902, at which time he had her photograph taken, which I now show you. He reported to me that the lid was like its fellow. The conversion of the lower lid into a solid mass of tubercles, this mass as thick as your little finger, I believe to be a unique clinical picture. Bordley reports the spontaneous cure of but three cases of tubercular conjunctivitis. The cases of spontaneous healing, which I have been able to find were ulcerative in character. The apparent resolution (I will not say cure) of such a local manifestation as I have presented, without surgical interference and without local treatment, I believe to be unique.

PAPILLOMATA OF THE CONJUNCTIVA AND CORNEA.

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According to those who have investigated the subject, cases of papillomata of the conjunctiva and cornea are rare. Whether this is due to the neglect of eye surgeons to report such cases or whether they really seldom occur, the writer does not know. He believes that if all conjunctival growths were subjected to a careful, histological examination, the number of such tumors would be materially increased. Up to the present time, thirty-two cases have been reported where the microscopical examination revealed true papillomata. This is rather surprising in view of the not infrequent occurrence of malignant neoplasms of the conjunctiva, and leads one to believe that, in some cases, growths, which, in the beginning are of papillomatous type, degenerate into malignant epithelial tumors. A few cases of the rapid recurrence of papillomata, which were undoubtedly malignant, are on record. Thus, in a case reported by Magnus, the microscope revealed what was thought to be a true, benign papilloma of the conjunctiva. But the rapid recurrence with extensive destruction of tissue placed it in the class of epithelial cancer. The boundary line between papilloma and epithelioma is in some cases very narrow and the microscopical diagnosis extremely difficult to make. As an illustration of this statement, the writer knows of a case of a laryngeal growth which was given to a noted pathologist for diagnosis. After careful and repeated examinations, he declined to make a positive diagnosis but was inclined to think that the tumor was papillomatous in type. The

Read before the Ophthalmological Society, Baltimore.

downward course of the patient, however, proved to the contrary. Before taking up the literature of the subject and describing the differential diagnosis between papilloma and epithelioma of the conjunctiva, the writer wishes to report two cases of tumors of the limbus which have recently been operated upon at the Presbyterian Hospital. The first case came to the hospital during the service of Dr. Jas. J. Carroll, to whom I am indebted for the notes as he recorded them and for permission to publish the same. The patient, P. B., colored, 56 years old, farmer, native of Virginia, came to the out-door department April 29th, 1902. His general health seemed good and his only complaint was pain in the right eye. He stated that in November, 1901, some dust flew in his eye and he believed that all of it was not removed. The latter part of the following February, he noticed a small tumor at the inner margin of the limbus of the right eye and experienced some pain. Later, the pain at times was quite severe. Vision was 15/200. The growth was of a whitish-gray color, of irregular surface, slightly movable, projecting about 2 mm. on the cornea to which it was adherent. The base of the tumor was surrounded by injected blood vessels. There was no ulceration. The neoplasm was about 8 mm. long and 5 mm. broad. The pupil dilated under atropia with one point of adhesion in the upper and inner quadrant. There were four or five points of pigment on the capsule of the lens, the remains of an old iritis. The disc was good. The left eye was normal in every respect. May 2, 1902, the tumor was dissected off and the base cauterized with carbolic acid. The specimen was hardened in alcohol, embedded in celloidin and sections stained with hematoxylin and eosin and Van Gieson's stain. On examining the sections microscopically, the first thing that struck the eye was the enormous epithelial proliferation. The outer layer of epithelium was squamous in character and nuclei not well defined. Next to this layer and occupying the central part of the proliferating mass, the cells were ovoid or polyhedral with nuclei more or less round and deeply stained. At certain points the cells were collected together resembling epithelial pearls. Internally and next to a connective tissue frame-work, the cells assumed the cylindrical shape with oval nuclei. The connective tissue

was beautifully separated from the cellular structure by both stains, the smallest fibres being clearly visible. In structure it consisted of rather loose, fusiform fibres, poor in cells. Running up into the epithelium were long, narrow papillae of connective tissue containing blood vessels. The blood vessels were large and numerous. There was no tendency of the epithelium to infiltrate the surrounding tissues or any cutting off of the same. As the patient has not returned to the hospital it is not known whether there has been a recurrence or not.

Case two was operated upon by Dr. Harlan and differed histologically in some respects from case one. J. E., 36 years old, perfectly healthy, was admitted to the hospital in January, 1903. Some time previous to his entrance, a pterygium had formed at the inner margin of the cornea of the left eye. The growth was removed but promptly recurred. It was again removed and the denuded surface covered with a piece of conjunctiva from a rabbit's eye. A second recurrence necessitated another operation. This time the wound was covered with skin in the hope of avoiding further trouble. At the time of his entrance into the hospital there was a small, flat, lobulated tumor, white in color, situated at the inner margin of the limbus of the left eye. It was slightly movable and projected over the cornea for 2 or 3 mm. It measured 5 or 6 mm. in all diameters, being nearly round. The conjunctiva was somewhat injected. At one point it was attached to the cornea. The tumor together with considerable scar tissue from the previous operations was dissected off and the wound covered by loosening and stretching normal conjunctiva above and below. The patient made a good recovery. A small piece of the growth was hardened by the quick method and sections made in forty-eight hours. The staining was with hemotaxylon and eosin. In longitudinal section, the following appearances were revealed: The surface of the tumor showed epithelial cells slightly proliferated, and at one point loss of cells with leucocyte infiltration—a beginning ulceration. Two hair follicles were seen, probably derived from the transplantation of skin. The epithelial cells were squamous, polyhedral and cylindrical from without inward. The main body of the tumor consisted of connective tissue, rather compact,

with broad, rudimentary papillae running up into the epithelium. Blood vessels were not numerous. The loss of epithelium with leucocyte infiltration would speak for malignancy. With this important exception, the tumor resembled a papilloma or fibro-papilloma in which connective tissue predominated.

According to LaGrange, whose excellent work, "*Traité des Tumeurs de l'Oeil*," has been of great assistance to the writer, papillomata of the conjunctiva must be composed of (a) a frame-work of connective tissue of the membrane which is the seat of the new formation, (b) of blood vessels ascending into papillae, reproducing with more or less variations the types of those of the different papillae of the skin, (c) of an epithelial surface, the epithelium being arranged in layers usually cylindrical, ovoid or polyhedral, and squamous from within outward. If a tumor possess these characteristics it can be classed as benign. The literature of papillomata of the conjunctiva and cornea is not very extensive. The first case was reported by Horner in 1871. The tumor was removed but promptly returned and presented all the features of carcinoma. As no microscopical examination is recorded, it must be assumed that the growth was malignant from the beginning. In 1881 Fontan described an interesting adeno-papilloma. Two years later Parosotti contributed two cases to literature, one aged 5 years and the other 40. Other cases have been reported by J. Hirschberg and Birnbacher, Magnus (whose case was papillomatous but pursued a very malignant course), S. Fuchs, Sims, Gillet de Grandmont, Wagenmann, Coggis, Jessop, Steiner, Cox, Grunert, L. Roche, and Ayers. Papillomata of the cornea have been reported by Gayet, Blaise, Frost, LaGrange (malignant from the beginning), Demichieri, deWecker and Kalt. Recently A. Contino has described seven cases of papillomata of the limbus and cornea.

Differential diagnosis: In most cases it is impossible to diagnose between papilloma and epithelioma of the conjunctiva, if the tumor be seen in the beginning. The microscopic appearances are usually the same and one must be an expert diagnostician indeed who would make the diagnosis without the aid of the microscope. The age of the patient does not help us, for the literature teaches

that both tumors can occur from childhood to old age. The recurrence of the growth gives us no information, for, as is well known, both recur with startling regularity. In the later stages absence of ulceration would speak for papilloma, for epithelioma invariably ulcerates if not removed. The microscopical examination, if carefully made, will tell us whether we are dealing with a benign or a malignant growth, and should be resorted to in every case of conjunctival tumor. Though both growths have an aggravating way of returning, one likes to feel that he is dealing with a benign neoplasm. In a pure papilloma the microscope shows the characters mentioned above, viz: epithelium of the skin or mucous membrane, from which the tumor springs, more or less proliferated in a regular and orderly manner, squamous, polyhedral, and cylindrical from without inward, connective tissue bound together more or less compactly and containing blood vessels, the essential characteristic of the connective tissue being papillae corresponding in some or all respects to the papillae of the skin. In epithelioma a very different state of affairs are seen. While in papilloma the arrangement of the tissues is regular, in epithelioma there is a chaotic condition. Irregularity and disorder run riot. The epithelial cells are seen in groups completely cut off and isolated from the main mass of proliferating epithelium. In each group is usually seen what was formerly considered characteristic of epithelioma, the so-called epithelial pearls. Sometimes masses of epithelium can be seen dipping down into the neighboring tissues but not entirely cut off from the main body. The presence of ulceration, however small, speaks for malignancy. To the writer the great importance of a careful microscopical examination in all cases of tumors of the conjunctiva and cornea is very obvious. In years gone by, not a few eyes with normal vision have been sacrificed for tumors of the limbus, which were diagnosed as malignant from the macroscopic appearance. Some of these might have been saved by a microscopic examination, and certainly it is worth while to give the patient the chance of the possibility of a benign growth. In this enlightened age such a thing could not happen, and it is in preventing such deplorable accidents that the microscope plays an important role. If the writer has

succeeded in emphasizing the fact that all tumors of the conjunctiva and cornea are not malignant, and that, in their incipency, a positive diagnosis can nearly always be made by the careful use of the microscope, this modest contribution to the literature has not failed entirely in its mission. It is our duty as oculists to examine carefully all tissue removed from the eye that the pathology of our specialty may keep pace with the pathology of other branches of medicine.

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A CLINICAL LECTURE ON THE ART OF EXTRACTING FOR CATARACT.*

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SURGEON TO THE NOTTINGHAM AND MIDLAND EYE INFIRMARY.

MR. PRESIDENT AND GENTLEMEN: I have here a patient on whose right eye I operated for cataract in his ninety sixth year. As you see the pupils are central, and he can read for hours and tell the time by the Exchange clock.

I also have here another patient aged sixty, both of whose eyes I operated upon for cataract by extraction four years ago. On his recovery from the operation he obtained employment as a smith in the furnace department of one of our principal railways, and has since been exposed day by day as a striker to the very trying glare of incandescent metal; nevertheless, you will note that both eyes are perfect, I may say, without exaggeration, singularly beautiful, that sight is excellent, that he does not require to wear glasses, and that all trace of surgical intervention is conspicuously absent.

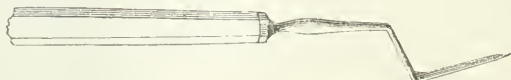
The cases of *double* extraction for cataract, to which I had the honor and pleasure of calling your attention a few evenings ago although operated on within the last few weeks, were equally remarkable in result and equally free from all trace of operative interference. Now I need not tell you that this is the perfection of art, *i. e.*, to conceal art, and I propose to-night to lay before you some of the reasons by which I was led to the adoption of a method of treatment which has yielded such satisfactory results.

When Professor Waldau, the late von Graefe's assistant, whose practice I followed in Berlin, proposed to excise a small piece of iris and then to scoop out cataracts with a spoon, he did so because, although at that time suppuration was by no means rare after cataract extraction, it was almost never observed as a result of simple iridectomy. It occurred to me that a slight enlargement of

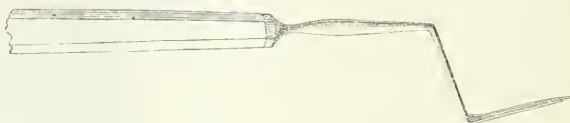
*Delivered before the Nottingham Medico-Chirurgical Society.

Waldau's incision would enable us to dispense with that very objectionable instruments—Waldau's steep-edged spoon—and later on seeing the importance of maintaining a perfect screen and a central and movable pupil after ablation of the lens, I determined to enlarge Waldau's incision still further, and to dispense not only with the spoon but also with iridectomy. Waldau made his incision with a broad trowel shaped keratome, entered at the summit of the cornea precisely in the corneo-sclerotic junction. I have attained the same end with greater facility and absolute precision by substituting one or other of the knives depicted in actual size below.

No. 1 for the Right Eye.



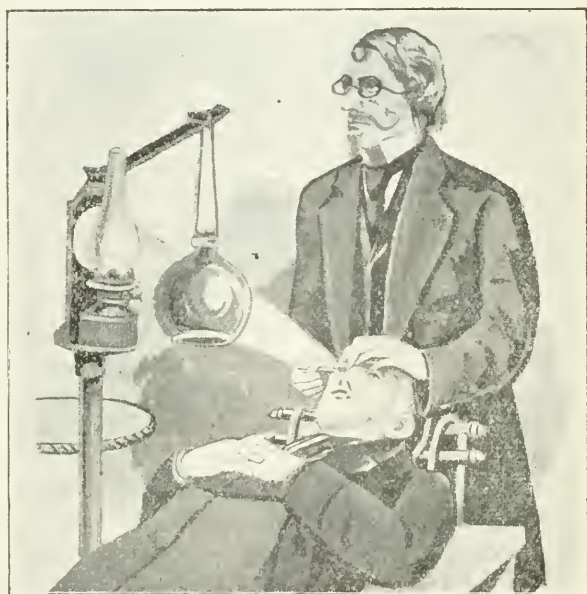
No. 2 for the Left Eye.



In performing this operation it is necessary to separate the lids with a light speculum, easily displaced, to steady the eyeball with forceps which perforate the sclerotic, and to enter the knife, which should be in first class condition both as to point and edge, in the cornea close to the sclerotic junction, at the base of a flap which when completed will comprise nearly if not quite one-half of the cornea. The knife is then pushed quickly across anterior chamber until it emerges at a counter-puncture similarly placed, sawed, if I may be allowed the expression, rapidly upward, so as to get in to the iris, which would otherwise fold over the edge of the blade, and then turned forward so as to complete the section precisely and deliberately in the upper border of the corneo-sclerotic junction. In this way a flap is formed which fits like a watch glass so precisely

that the wound is invisible the moment the knife is withdrawn, which is at once agglutinated to adjacent tissues and which ultimately leaves no trace. I prefer to lacerate the capsule widely, but only in its periphery, as suggested by Knapp, and always do this part of the operation with a very light hand, lest the lens be displaced or cortex separated or a portion chipped off. If now slight pressure be made at the lower border of the cornea or if the patient looks down the wound will gape, the lens will present at the pupil, which it slowly dilates, performing a movement of bascule and then emerges *totus teres* and if not *atque rotundus*, at all events with an unbroken surface, the flap falls anatomically into its place, and if all has gone well there will be no cortex to squeeze out (because there has been none separated from the nucleus) and no prolapse of the iris (because it has not been unnecessarily strained during the passage of the lens) or other trouble then or after to vex the soul of the operator or disturb the serenity of the patient. If the wound does not gape on slight pressure or when the patient looks down—and here is the crux of the whole matter—it is because the incision is not large enough or the wound has been wasted by cutting between the layers of the cornea instead of entering the chambers at once, in which cases it, the wound, may be enlarged by curved blunt pointed scissors adroitly manipulated; if it still does not gape on pressure there is some complication or deviation from natural conditions which will have to be met *secundum artem* or the eyeball may be closed for a season and the experience gained be utilised to the benefit of both patient and operator on some future occasion. I will not detain you now with details on these points. What I wish to emphasize is that the operation I have described is differentiated from all others by the extremely narrow knife, as narrow as narrow can be, with a deep shank for the left eye by which the right hand may be used for the left and the necessity for ambidexterity on the part of the operator dispensed with; by the large easily gaping wound limited to the corneosclerotic junction and differing but little in size from Daviel's of one hundred and fifty years ago; by the consequent complete evacuation of the lens and cortex, so obviating prolapse of the iris, and by results which are

certainly beyond compare. Indeed there can be no question that such patients not only look better and see better (the contractile pupil replacing accommodation and compensating, as in aphakial animals) for the loss of the lens, but that they are much better able to bear the brunt of life (witness the smith I have introduced to your notice) and much less liable to any ulterior ill consequences than if they had been operated on by one or other of the combined methods which have been so fashionable of late years.



When operating I stand behind the patient, who is reclined, and I almost invariably use artificial light. The chimney of the lamp which some of you have seen me use for extraction in this room is an excellent steriliser, and the knives, curettes and prickers may be soaked in absolute alcohol, while the patient's face, especially the eyelids and roots of the lashes, are sponged with the same fluid.

Cocaine and holocaine in the vast majority of cases suffice for anesthesia, but if the patient proves very refractory as now and then happens, ether nebulised by

nitrous oxide may be given or ether alone may be administered by the thermogeninhaler or a modification of the cone, both of which prevent freezing, and are in my opinion far superior to Clover's or any other apparatus of the kind. The patient should be got quickly under by the exclusion of air and the operation commenced at once during the first period of ether anesthesia, in which cases, according to my experience, you will seldom have sickness or subsequent trouble of any kind. I may mention that I have on several occasions demonstrated what I believe to be the advantages of the operation I have described. I have for instance, exhibited cases of double extraction at the Clinical Society of London, again at the Royal College of Physicians, when the International Ophthalmological Congress met there, again at the Royal Ophthalmic Hospital, Moorfield, when the late Sir William Bowman declared that the results of my operations "left nothing to be desired," and more recently I have submitted a number to the Ophthalmological Society of the United Kingdom, at their rooms, Chandos street, London.

Mr. President and Gentlemen:—I have endeavoured to treat a big subject in a very few words and a very small space. Some important details with regard to complicated cases are necessarily omitted, but I hope I have said enough to be understood, and as I number my cases of extraction by the thousand and am constantly operating, I hope I shall not be deemed presumptuous in placing the results of my experience at the disposal of my distinguished colleagues, and the members of this learned society.

CLINICAL AND HISTOLOGICAL REPORT OF A CASE
OF PURULENT METASTATIC OPHTHALMIA IN
MENINGITIS, GIVING RISE TO MENINGITIC
AND SYMPATHETIC SYMPTOMS AFTER
THIRTEEN YEARS.—ENUCLEATION.
—RECOVERY.*

BY

DR. C. ZIMMERMANN,

MILWAUKEE WIS.,

AND

DR. BROWN PUSEY,

CHICAGO.

ILLUSTRATED.

By purulent metastatic ophthalmia we mean a secondary endogenous purulent affection of the eye commencing in the retina or chorioid, caused by conveyance of infectious matter, (microörganisms), from other primarily diseased parts of the body to the eye in pyemic conditions. Such may be surgical or traumatic, puerperal or due to internal infectious diseases, or the primary affection may be hidden during life, becoming apparent at autopsies, or not at all, and therefore called kryptogenetic. The infection takes place through the circulation either directly or indirectly by first causing endocarditis, which, by itself, emits infectious material. In both cases the latter reaches the eye either in form of septic emboli which give rise to purulent inflammation of the tunics of the eye or through hemorrhages into the tissues. Blindness is not instantaneous as in bland embolism of the central retinal artery, although it develops rapidly within 24 hours, as we have

*Read before the Milwaukee Medical Society, March 24, 1903.

here capillary embolism, the infectious matter being rather minutely distributed.

According to the different primary diseases, the nature and virulence of the infectious agents vary, although the morbid process in each is identical. In puerperal pyemia, the streptococcus, in surgical, the staphylococcus and in pneumonia and meningitis the diplococcus lanceolatus predominate, the latter producing the mildest form, most frequently ending in phthisis of the eye, with preservation of life, while the others mostly entail panophthalmitis with perforation and destruction of the globe, generally terminating fatally. Although the eyeball cannot be considered as an organ very abundantly supplied by blood, in comparison to its volume, and thus would rather seem not especially predisposed to affections induced through circulation, particularly larger emboli; a certain predilection for capillary embolism may be given in the narrow caliber of the capillaries of the chorioid immediately behind the ciliary body, amounting from 4 to 6 micron (Sattler) and of the retina, 5 to 6 (Leber) while those of the remaining chorioid measure from 10 to 30 micron. Aside of this, Axenfeld called attention to the fact that the blood current in them must be somewhat retarded by the intra-ocular tension, and to disturbance of circulation due to sepsis, marantic thrombosis, degeneration of the endothelium and alterations of the walls of the blood vessels, e. g. senile, which are more apt to arrest the germs. Since metastatic ophthalmia of both eyes renders the prognosis almost always fatal, as it occurs only in the most septic cases, this view gains greatly in probability. Axenfeld found the bilateral affection in $\frac{1}{3}$ of the cases. The more frequent occurrence of metastatic ophthalmia in puerperal pyemia may also be a consequence of the great changes the whole body, particularly the circulation, undergoes in the puerperal state.

There are two ways in which the infection of the eye may take place in meningitis: First, by infection of the blood through the meninges and subsequent embolism, or second, by direct propagation from the meninges through the sheaths of the optic nerve to the eye ball. How far the blood may be infected by meningitis is so far not sufficiently ascertained. It may be assumed from metas-

tases in other organs as pleura, peritoneum, pericardium, endocardium, joints, etc., in which numerous microbes have been found, but only in a few cases in which pyogenic cocci were undoubtedly present in the blood, these have actually been discovered. Meningitis and metastatic ophthalmia may also be coordinated, but not synchronous, symptoms of a kryptogenic pyemia from other sources. This shows that the infection of the eye by an embolic process cannot be explained by a uniform theory (as pointed out by Herrnheiser and Axenfeld).

Propagation of meningeal inflammations to the sheaths of the optic nerve has been frequently observed, but not a continuous migration of microorganisms along the sheaths into the eyeball. Axenfeld reported a case of metastatic ophthalmia in meningitis with infection of the blood, in which he found the whole length of the vaginal spaces of the optic nerve enlarged and filled with densely crowded round cells and abundant diplococci lanceolati between them as far as to the lamina cribrosa, but not beyond it. Those found on the disc, forming a thin elongated mass of zoogloea not over 2 mm. long, between the optic fibres and corresponding to the plugged capillary bloodvessel, were not in connection with the intravaginal cocci. The intraocular infection in this case is attributed to capillary embolism. Although, at a later stage, the intravaginal and intraocular micrococci may meet, the two different inflammatory process must not be confounded. A. gives for some cases of metastatic ophthalmia the explanation that the continuation of the meningeal inflammation along the sheaths may cause optic neuritis and, by the subsequent disturbances of circulation in the eye, especially the retina, may attract microbes circulating in the blood, which will multiply and produce purulent inflammation. In case mentioned, Axenfeld observed a direct immigration of pneumococci from the meninges through the supraorbital fissure into the tissues of the orbit without connection with thrombosed bloodvessels, starting here an inflammation, which was recognized during life by slight chemosis. He considers them as independent of the intraocular suppuration, else a greater involvement of the orbit which would occur more frequently than it really does.

For further particulars we refer the reader to the inves-

tigations of Axenfeld in his elaborate paper "On purulent metastatic ophthalmia, especially its etiology and prognostic value," (v. Graefe's Arch. 40, III and IV), derived from 14 cases of his own and from a compilation of the entire literature up to 1894, comprising almost 200 cases, and to the article of A. Groenouw: "Relations of general and organic diseases to changes and affections of the visual organ," in the hand book of Graefe-Saemisch, 2nd edition, p. 498, with statistics on 166 more cases and bibliography up to 1901.

Although, according to general observations, metastatic purulent ophthalmia in meningitis hardly ever leads to panophthalmitis and almost always the lives of the individuals affected with it were preserved, scarcely any anatomical examinations exist of globes that had grown blind from it. Thus we think the clinical and anatomical descriptions of the following case will be of interest.

E. M., a girl aged 1 year and 2 1/2 months, was taken sick on February 15th, 1889 with meningitic symptoms, convulsions, loss of consciousness and fever, which persisted more or less. Gradually an inflammation of the right eye developed. February 22nd, I saw her in consultation with Dr. W. A. Batchelor. On oblique examination, which was done when the child was sleeping, the *right eye* showed the following condition: Cornea clear, without inflammatory changes. Pericorneal injection, no chemosis, no swelling of lids, no discharge. Anterior chamber filled with pus. Iris inflamed, swollen, irregular in its surface, protruded, does not react to light. An ophthalmoscopic examination was impossible on account of the pus within the eyeball. *Left eye* of normal appearance, no changes in fundus visible.

Diagnosis: Metastatic iridochorioiditis, apparently due to meningitis. Instillation of atropine and calomel internally were ordered.

At the next consultation, on April 16, 1889, the condition of the right eye was this: Cornea clear, iris discolored, pupillary margin bulged forward like a cone, seem to touch the posterior surface of the cornea. Pupil less than medium sized, is immovable from circular synechiae, and partly covered by pupillary membranes. Yellowish reflex from the interior, details of the fundus are not visible. T.

diminished, right eyeball smaller than left, phthisis commencing. No pericorneal injection, which sets in when the eye ball is touched. This condition corroborated the diagnosis. The child was recovering.

I did not hear of the patient any more for 13 years, until April 1, 1902, when I was called again to see her in consultation with Dr. Batchelor, who was treating her for several days, on account of pain in the abdomen, which was somewhat retracted, gastricism and fever with a temperature of 100, pulse of 50. At the same time the right eye had become inflamed and was painful and the patient complained of severe headaches so that Dr. B. anticipated a very unfavorable prognosis. I found the following condition: *Right eye*, red, chemotic, very painful, especially to the touch. No discharge. T. increased, the whole cornea leucomatous. Eyeball not protruded. The patient had also pain and photophobia in *left eye*, which easily become tired and showed some redness, i. e., symptoms of sympathetic irritation. Fundus and V normal. From the symptoms described it was clear to me that a cold or some other influence had rekindled the dormant infectious material in the diseased eyeball and set up a new inflammation by endogenous infection, which threatened to propagate to the brain and to create meningitis, at the same time endangering the other eye by sympathetic inflammation. As no marked infiltration of the orbit could be ascertained, the chemosis being of moderate degree (thinking of the danger of enucleation in panophthalmitis) I considered it as the only safeguard to remove the existing cause by enucleation of the diseased and blind eyeball, which I performed the same day. Headache and all distressing symptoms of threatening meningitis, as well as of sympathetic irritation of the other eye, at once disappeared after the operation. The pulse rose to 100, temperature 100.2 the next day, but both became normal after a few days, and the patient made an uneventful recovery.

An equatorial section of the globe immediately after the operation evacuated hemorrhagic fluid and revealed total detachment of the retina, coagulated exudations behind lens and ciliary body. A section through the cornea showed the latter opaque throughout and thickened. An-

terior chamber obliterated, anterior capsule of lens covered by a thick white adherent membrane. Optic nerve atrophic. The eyeball was placed in formalin and for microscopic examination, sent to Dr. Brown Pusey who kindly furnished the following report:

FROM THE PATHOLOGICAL LABORATORY OF RUSH MEDICAL COLLEGE.

"The parts put together formed a mass about half the size of a normal eyeball. There was a good sized piece of nerve attached to the globe.

On account of the presence of salty deposits the tissue was decalcified in 1 per cent. HNO_3 . Following this process the anterior half of the globe was divided through the lens and cornea. The retina was found bunched up behind the lens; the cavity of the globe was more or less filled with a coagulated mass.

The parts were dehydrated in alcohol, imbedded in celloidin and cut in sections. Sections were stained with hematoxylin and eosin, by Van Gieson's stain, and various methods for bacteria.

Macroscopical Examination of stained sections.—The cornea and sclera are very much thickened. The optic nerve is rather smaller than normal; there is nothing unusual in the appearance of the sheath. A part of the lens remains—it is pushed up to the posterior surface of the cornea. Back of the lens there is a mass which extends from side to side across the globe, and apparently is made up mostly of detached retina. Still further back, in the region of the entrance of the optic nerve, there is another mass, which appears to be exudate, and which stains with eosin rather than the nuclear stain. The ciliary body and the chorioid stand out very markedly; these parts are thickened and stain darkly. In front the ciliary body (except at the limbus) and chorioid are detached from the sclera; posteriorly, the chorioid is adherent to the sclera.

Microscopical Examination.—The anterior epithelium of the cornea is irregular, in some places it is thickened, in others thinned, in still other places the epithelium is entirely absent; the substantia propria is made up of a mass of irregular, wavy fibres. It contains many new

blood vessels. An interesting finding in the substantia propria is that of points or areas which retain the hematoxylin and stain blue. These areas are numerous. They are of different sizes, but none of them are very large; in outline they are irregular. The outer edges are more deeply stained than the centers. These areas were probably caused by calcareous deposits. The superficial vessels at the limbus are not markedly engorged with blood. Descemet's membrane is well preserved. In places it forms peculiar folds, which project backward and are caught in the cicatricial tissue formed posterior to the cornea. Adherent to the entire posterior surface of the cornea—from limbus to limbus—is the iris.

The *iris* is of about the normal thickness in the pupillary region, while it is thinned at the periphery. It is a mass of cicatricial tissue, and, as was said, it is everywhere adherent to the cornea. There are comparatively few blood vessels in it. The sphincter muscle appears unchanged. The posterior pigment layer is markedly altered; it is broken up and mixed up in a mass of cicatricial tissue, which binds the iris to the slight remains of the lens.

Very little of the *lens* remains. It is surrounded by cicatricial tissue. The lens material is stained blue by the hematoxylin (probably a degeneration with the production of mucin). Back of the cicatricial tissue, which surrounds the lens, are the bunched-up and degenerated remains of the *retina*—remains that show very little resemblance to the normal tissue. Still back of the retina there is a mass of old cicatricial tissue; in this cicatricial tissue there are bone corpuscles and lamellae of mature bone.

The *ciliary body* proper is not much changed. Its blood vessels are rather full. The *ciliary processes* form an interesting picture. They seem increased in number and longer than normal, they are bunched in a striking manner and the lining cells of the processes—the pigmented as well as the non-pigmented cells—seem swollen. The seeming increase in number and length of the processes is probably explained by the shrinkage of the outer walls of the globe, as is also the peculiar bunching of the processes. In cross section the processes, with their swollen cells abutting one against the other, and the long lumen

formed in this way, make a picture that greatly resembles a tubular gland (Fig. 1) or the foldings of the mucosa of the Fallopian tubes.

In the region where the ciliary muscle leaves off and the chorioid begins, there is a marked infiltration of leucocytes, particularly of the polynuclear variety. This marked leucocytic infiltration also exists in the regions between the ciliary body and lens, in the bunched and folded degenerated retina, which is almost a mass of

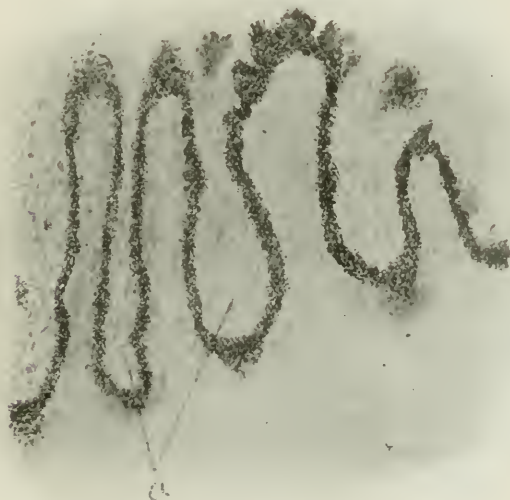


Fig. 1. a Ciliary Processes.

leucocytes, and, too, it is found in the cicatricial tissue posterior to the retina.

The *chorioid* is somewhat thicker than usual, and has almost entirely lost its resemblance to normal tissue. This is partly the result of a great cellular infiltration—an infiltration consisting mostly of polynuclear leucocytes, of which many of these are eosinophiles. Along the inner surface of the chorioid, which is irregular and which is disturbed, and is shown particularly in the breaking down of the retinal pigment layer, there are numerous concen-

trically laminated bodies. (Fig. 2). These bodies resemble the corpora amylacea of the prostate, and are identical with those which have been found in various parts of the eye and described (most recently by Naito. Graefe's Arch. LIII, 162) as amyloid bodies. Some sections show a thickening and staining reaction of the elastic lamina of the chorioid, which rather indicates that these bodies are the result of degenerative changes in this structure. In

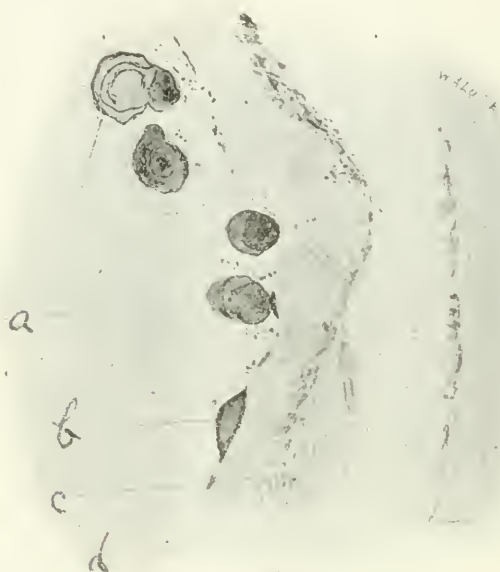


Fig. 2. *a*, Amyloid bodies; *b*, thickened and degenerated area of the glassy lamina of the chorioid; *c*, chorioid; *d*, sclera.

the chorioid still further back, and particularly in the region of the optic nerve, there is well-formed bone. All along the inner surface of the chorioid there are masses of leucocytes. These masses of cells, as they get into the cavity of the vitreous and away from the chorioid, become necrotic. The fact that these cells are removed from the blood supply may explain the necrosis.

The retina at the papilla is a mass of cicatricial tissue, which is more or less invaded by leucocytes.

The *optic nerve* is atrophic, with an apparently normal sheath. The intravaginal space is normal, possibly there is an increase of fixed connective tissue cells, but there are no leucocytes, and there is no exudate in this region. At the head of the nerve there is an increase of cells, which appears to be partly due to the presence of leucocytes; further back in the nerve no leucocytes can be made out.

Examination of the cellular tissue surrounding the sclera shows that posteriorly it has been more or less the seat of a fibrinous exudate containing leucocytes and red cells. In one region a little ways removed from the sheath of the optic nerve and back of the sclera there is a spot of cellulitis, which is particularly marked. Running through this inflammatory area and mixed up with it—with an apparently broken-down sheath—is one of the ciliary nerves. The leucocytes appear to follow along the sheath of this nerve. This observation suggested examination of the sclera to see if any particular involvement of the ciliary nerves could be made out as they pierced it. Such examination was practically negative, though in some sections where the nerve was accompanied by blood vessels it would be hard to say just what the relationship was between the engorged blood vessel, with its numerous leucocytes, and the nerve. The observation of a ciliary nerve (carrying sensory branches) accompanied by an engorged blood vessel, in practically the same channel in a dense tissue like that of the sclera, suggests interesting possibilities as regards pain.

The finding in this study can be summarized by the statements that we have a shrunken globe containing all the signs of an old general inflammatory process—old enough to have formed bone by metaplasia and, in addition, all the signs of an acute inflammatory process, and that the acute process has, except the iris, involved the whole eyeball and some of the cellular tissue back of it.

As to the cause of the recent changes, the most likely conclusion is that local conditions brought about the acute ophthalmitis. Possibly, a breaking down of granulation tissue attracted the leucocytes; maybe there were bacteria but they were not found in the histological examination. This fact, however, does not at all conflict with the sug-

gestion made here, for it is altogether probable that bacteria might have set up the process and have been dissolved before the enucleation of the eyeball: or it is possible that there existed in the tissue foci of organisms, which were not found in the examination, lying dormant in the shrunken globe (bacteria remaining from the old embolic process), when some influence, e. g., a blow or lowered temperature, decreased the vitality of the tissue or disturbed the equilibrium, which allowed the organisms to develop with the resulting acute inflammatory process. This latter conclusion agrees with the clinical history, especially the latter history of the case—the relief of symptoms following the removal of the globe.

The meningeal symptoms clinically suggested the possibility of an extension of the inflammatory process from the meninges to the globe. The histological findings decidedly combat this view. The optic nerve and its sheaths are almost part and parcel of the brain and the meninges; the ciliary nerves have a comparatively long and an interrupted course from the meninges to the globe. Histologically we find no involvement of the optic nerve and its sheath by the acute process.

We do find a possible involvement of a ciliary nerve—nerves which have an intimate relation with the chorioid. Anatomically, it seems altogether most probable that the process is travelling from the globe backward. The mildness of the cellulitis bears on this conclusion. Had the inflammatory process extended from the brain downward along the ciliary nerves, there probably would have been a more marked involvement of the cellular tissue, whereas, it is very insignificant when compared with the intense involvement of the interior of the eyeball."

In this case we had atrophy of the optic nerve, secondary to phthisis bulbi. The sheaths showed no signs of a former inflammation so that we can exclude direct propagation of the inflammatory process from the meninges through them. The metastatic ophthalmia apparently was due to an embolic process by an infection of the blood from the meninges or of kryptogenetic origin. That no microorganisms were found after so many years is no proof against it since they often are not obtainable even a short time after the commencement of the disease.

As to this point Dr. Banziger and W. Silberschmidt, in their article: "Zür Aetiologie der Panophthalmie nach Hackensplitterverletzung" (Bericht der Ophth. Gesell., Heidelberg, 1902, p. 222), make the following remarks: "It is peculiar how few similar findings in cases of panophthalmitis are contained in literature. The scanty positive results are, according to our experiments, due to the fact that the germs of panophthalmitis can be found in the vitreous of the rabbit only during a few days. The infected vitreous shows, as early as the first day, marked phagocytosis; most bacilli are within the leucocytes. On the third or fourth day after inoculation, the microorganisms have disappeared from the "Ausstrichpräparate," and the cultures remained sterile. Similar conditions must be assumed for the human eye, and globes enucleated after four, six or more days, cannot be utilized for bacteriological examinations. The possibility of a mixed infection from the start or secondary infection, following the first affection, must also be considered."

The most interesting feature was the giving rise of the diseased phthisical eyeball to meningitic symptoms after 13 years. This seems to be very unusual. Axenfeld (p. 126), e. g., remarks: "Reversely a purulent inflammation of the cranial cavity by ascendent infection from a metastatic ophthalmia through the veins and lymph channels is possible, but has never been proved with certainty." The meningitic symptoms in our case find a natural explanation in the anatomically proven recent inflammatory condition of the episcleral tissue, i. e., a process traveling upward, clinically indicated by chemosis. A propagation upward was arrested by enucleation.

The sympathetic irritation of the other eye is anatomically explained by the inflammatory changes of the surroundings of a ciliary nerve and blood vessel at their passage through the sclera.

These conditions (perineuritis and perivasculitis) are considered as a supporting evidence for the theory attributing the cause of sympathetic ophthalmia to the ciliary nerves, (Schirmer, Graefe-Saemisch, II edition, p. 112), and also as the eliciting moment in sympathetic irritation.

Practically the case illustrates the danger dormant in an eye which has apparently become quiet after purulent metastatic ophthalmia, and teaches the lesson to remove it at once as soon as symptoms of renewed inflammations set in, as they may produce sympathetic ophthalmia of the other eye or entail grave complications by traveling backward to the orbit and meninges.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

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PHILADELPHIA, PA.

ASSISTED BY

CLARENCE VAN EPPS, M. D.,

DAVENPORT, IOWA.

(Quarter Ending June 30, 1903.)

Conservative Ocular Surgery.

TORNATOLA, Messina. (*Revue Generale d'Ophthalmologie*, 31st March, 1903.) In 1894 Tornatola advocated the conservation of eyes which had been wounded by bird shot, even when the lead remained in the eye. Infection is not carried into such eyes by the lead but by other external agents which penetrate through the wound.

To close such wounds properly the author excises a semilunar flap of conjunctiva over the scleral wound and unites the gaping edges in such a way that the two openings do not correspond. Two cases are reported in which serious wounds in the corneal and ciliary regions recovered, leaving degrees of visual acuity equal to one-fortieth and one-eighth respectively.

Granting, he says, the inconvenience of an artificial eye and the possibility of sympathetic ophthalmitis, enucleation should be immediately done only in those cases in which it is impossible to reestablish a relatively normal ocular volume or degree of tension.

The Open Post-operative Treatment, Especially After Cataract Extraction and the Occlusion of the Lids by Means of the So-called Small Bird-Foot Sutures.

TORNATOLA (*Ibid.*) says that in 1772 Odhelius adopted the

method of abandonment of the post-operative ocular bandage. During the past five years various writers have advocated the same plan, for which the following advantages are claimed: (a) continual irrigation by the tears; (b) absence of local elevation of temperature; (c) the eye can be easily cleansed several times a day; (d) psychical depression is removed; and (e) traction upon the lids by the bandage is avoided. The author does not admit the reality of the above disadvantages of the bandage and believes that its employment is preferable to the open plan treatment. He says that where a bandage cannot be borne in certain cases, he makes use of two sutures in order to close the eyelids, these being inserted and made ready to tie just before the operation.

Upon the Origin of the Vitreous Body in Vertebrates.

TORNATOLA'S (*Ibid.*) studies upon this subject demonstrate: first, the normal vitreous humor is always composed of fibrillae which do not exhibit any granulations; second, there are not any pseudocells at the points of intersection of the fibrillae; third, there do not exist any fibers arranged in the form of a rosary in the vitreous body (this appearance being of pathological origin); fourth, there is not any hyaloid membrane; fifth, there is not any true internal limiting membrane of the retina; and, sixth, the vitreous body arises from the cells without nuclei which form the base of the pars ciliaris retinae and from the elements which, in the differentiated retina, constitute the neuroglia. With these cells the vitreous remains in close relation.

Purulent Streptococcus Ophthalmia; Corneal Ulcerations; Failure of the use of Silver Nitrate and Protargol. Cure in Three Days by the Employment of "Roux Serum."

DARIER, Paris. (*La Clinique Ophtalmologique*, 10th. March, 1903.) Darier reports a case of purulent conjunctivitis which was due to infection of streptococci, and in which injections of the "Roux serum" with the use of a pomade of collargol were rapidly efficient. The author has noted a marked improvement after the employment of the serum and usually also a relapse in the suppuration in cases of streptococcal infections. These relapses, he

says, seems to be prevented in measure by the use of the collargol ointment.

Collargol in the Treatment of Ocular Infections.

TROUSSEAU, Paris. (*La Clinique Ophtalmologique*, 10th, March, 1903). Trousseau has employed inunctions of three grammes of fifteen per cent. strength ointment of collargol in one case of puerperal sepsis with suppurative chorioiditis in one case of apparent panophthalmitis complicating pneumonia; and in one case of post-extraction iridocyclitis, with excellent results after failure of the usual remedies.

In cases of rheumatic, gonorrheal, and syphilitic iritis the results with the drug have not been so brilliant.

On an Operative Method for Ptosis.

SOURDILLE, Nantes. (*La Clinique Ophtalmologique*, 10th. March, 1903.) Sourdille has never practiced the Motaïs operation because of its difficulty and the disturbances caused by using a common elevator for the globe and the lid. Panas' method of palpebro-frontal anastomosis, he says, is efficient, but has the disadvantage of obliterating the orbito-palpebral furrow. To preserve this furrow the author makes a curved incision about an inch long in shaved region of the eye-brow; divides the orbital septum at its insertion into the orbital margin; raises the elevator of the lid; passes two X shaped double needled sutures through it; and then divides the tendon. By means of a bistoury a passage between the periosteum and the frontalis muscle is made, and the sutures are then passed through the latter and the skin, and fastened over a roll of gauze placed about four millimeters above the eyebrow. The wound is closed. The guy sutures are removed on the seventh or eight day.

Medicinal Dosage in Ocular Therapeutics.

LE PRINCE, Bourges. (*La Clinique Ophtalmologique*, 10th, March, 1903). Le Prince makes a plea for more accurate dosage and more careful asepsis in the preparation and the use of drugs which are used in ophthalmology.

Two Cases of Transient and Intermittent Colored Vision.

WINSELMANN, Berlin. (*La Clinique Ophtalmologique*,

25th. March, 1903.) In the first case, that of a woman of fifty-one years of age, there were biweekly attacks of migraine associated with scintillating scotoma with the seeing of the flashes of colored light which alternated with more or less permanent visual apparitions. The color fields were not studied. There was moderate contraction of the form fields. A diagnosis of the case was not made. In the second case—a male of thirty-eight years, there was scintillation associated with violent pain in the head and orbits lasting for several minutes at a time. On leaving his room for out-of-doors the patient seemed to see a green maple leaf which was situated in the center of his visual fields. The fields were concentrically contracted and the color-fields were reversed, making, the author says, a positive diagnosis of hysteria.

A Case of Progressive Ophthalmoplegia.

(*Ibidem.*) Winselmann reports a case of progressive ophthalmoplegia in a male of forty-three years. There was a history of primary syphilis which had been contracted twenty years previous. There were accompanying signs of tabes dorsalis.

Loss of Vision as the Result of an Observation of an Eclipse.

(*Ibidem.*) The patient, a female of twenty-one years of age, had three years previously observed an eclipse of the sun with the unprotected right eye. Ocular pain was noted immediately afterward and vision with the eye was lost. Examination showed a central scotoma and a visual power which was equal to the ability to count fingers. The ophthalmoscope showed a dark-red pea-sized spot situated near the macula.

The Cosmetic Value of Paraffine After Enucleation.

MAITLAND RAMSAY, Glasgow, Scotland. (*La Clinique Ophthalmologique*, 25th March, 1903.) After enucleating as for Mules' operation, Maitland Ramsey introduces liquified paraffine into the sac of the capsule of Tenon in which had been passed a purse string suture. The muscles were then united and the conjunctiva was sutured. He has employed this method in twenty-two cases, and has but four failures through escape of the material. The success

of the operation depends, he says, on two essentials: first, asepsis, and second, the care taken in introducing the purse string suture before injecting paraffine.

Trichiasis by Adiposus of the Lids.

BOUCHART. (*La Clinique Ophthalmologique*, 25th March, 1903.) Bouchart reports a case of trichiasis due to excess of subcutaneous fat in the eyelids. The condition was relieved by excision of the fat, a partial division of the orbicularis muscle, and finishing the operative procedure in accordance with the Panas method.

A Slight Modification of the Panas Method for the Relief of Entropion of the Upper Lid.

THILLIEZ, Geneva. (*La Clinique Ophthalmologique*, 25th March, 1903.) Thilliez does not completely divide the tarsus for a space of one and a half millimetres in its center, thus preventing an over-riding of the segments. He employs catgut rather than silk to suture the lower segment to the levator, and he cuts the suture quite short.

Grave Infections of the Cornea with Marked Perforation of the Membrane of Descemet.

COLLOMB, Geneva. (*Archives d'Ophthalmologie*, March, 1903.) Collomb reports a case of serpiginous ulcer of the cornea complicated with hypopyon and glaucomatous symptoms. Histologic examination revealed the usual corneal infiltration at the seat of the ulcer. Posterior to the ulcer the middle layers of the cornea were clear, but the posterior layers were deeply infiltrated, the membrane of Descemet being slightly bulged posteriorly with a small perforation at its apex. Resting on the posterior surface of the cornea was a small globular mass of pus cells. From a study of his case the author concludes: I, Gross perforation and deep infiltration of the cornea which is only an intermediate stage of the same process, are frequent in infectious keratitis; II, in this case and in others the perforation took place from without inward (from the cornea to the anterior chamber), and the deep abscess was principal cause of the same; III, the glaucomatous state of the eye was only of slight influence in the causative process.

On So-Called Essential Intraocular Hemorrhages.

SCRINI AND BOURDEAUX. (*Archives d'Ophthalmologie*, March, 1903.) Scrini and Bordeaux report two cases of essential intraocular hemorrhages and review the literature of the subject. The first case was seen in a 22-year-old man whose father was a sufferer from organic heart disease. The patient had had numerous attacks of epistaxis when three years old. After two attacks of hemorrhage into the vitreous humor of the left eye vision was lost temporarily to be restored later to normal, leaving the fundus changes known as "pseudoproliferating retinitis." In the right eye there had been no apparent disturbance of vision, but there was pigment deposit in the upper inner segment of the fundus similar to those following the hemorrhage into the external layers of the retina.

The second case was that of a man aged 26, whose family and past medical histories were negative. Vision had been slowly and almost completely lost on the left side, and was reduced to one-half of normal on the right side. Vision with the right eye returned to nine-tenths of normal, the fundus exhibiting the remains of hemorrhages situated above the disc. The vision of the left eye became equal to the ability to see to count fingers at fifty centimeters, and the fundus changes were those of "retinitis proliferans."

Abadie, they state, has divided intraocular hemorrhages into four classes: a, acute and relapsing hemorrhages; b, dyscrasic hemorrhages—of rapid evolution but less so than the preceding variety—often relapsing and terminating in cure or in disorganization of the eye; c, hemorrhages due to lesions of the deep membranes; and d, apoplectiform hemorrhages dependent upon rupture of the vessels or vasodilation.

The authors include in their list only those cases of intraocular hemorrhages for which there is not any apparent cause; cases occurring in young subjects without any apparent hemorrhagic taint, and in whom the vessels should be normal. To these cases they apply the term 'essential relapsing hemorrhages.' This condition, they state, appears once or twice among about five thousand cases, and is usually found in subjects between the ages

of 20 and 30 years. The condition is much more frequently seen in the male, and it usually affects both eyes. The hemorrhage may occur from the retinal or the chorioidal vessels, and may be situated in any part of the fundus. As a rule it is presumably due to the rupture of a vein. The etiology of the affection, they say, is obscure. They suggest an hereditary or an acquired change in the vessels and blood dependent upon disturbed metabolism in addition to causes of congestion, such as an inclined position, heat, accommodative efforts, etc. As to prognosis, they believe nothing can be promised the patient. Recovery may occur or permanent disability may follow; while relapses are always to be feared. As to life, the occurrence of the hemorrhage has no relation whatever.

Trachoma and Purulent Ophthalmia in Egypt.

JACOVIDES, Alexandria. (*Archives d'Ophthalmologie*, March, 1903.) Jacovides concludes his article as follows: trachoma and purulent conjunctivitis, formerly confused as one disease, are different disorders. They differ not only in their clinical aspects and their general symptomatology, but also in their pathogenesis. The specific pathogenic agent of trachoma is still unknown. As to those of purulent ophthalmia these are all the microbes of suppuration—the gonococcus being the principal one.

Trachoma in Egypt, as elsewhere is, he says, not a consequence of purulent ophthalmia; it is in all ways comparable with that which is observant in Europe, as well as in the remainder of Africa; a malady which is essentially chronic and may have regular exacerbations that are not however acutely trachomatous in type. Its great frequency as well as its propagation among the natives of the lower class, are due to special climatic conditions, and to the life and customs of the inhabitants.

It is not exact to say the Egyptians are "granular;" still less is it that they are "born granular." The proportion differs according as one examines the lower class (seventy to seventy-five per cent.) the middle class (fifty-five to sixty per cent.) or the upper class (thirty-five to forty per cent.).

One can, he says, distinguish three types of granulation: first, the true (pure granulations); second, the

mixed, (granulations and papillary hypertrophies); and third, the false (simple papillary hypertrophies).

Purulent ophthalmia, in Egypt is not, he believes, an acute attack of trachoma, and consequently is not dependent upon the latter affection. Purulent ophthalmia may graft itself on trachoma and hence complicate it, but it is only a superposed affection, of which suitable treatment removes all traces.

Purulent ophthalmia, endemic in Egypt, he says, becomes epidemic during the summer, and attains a maximum during that season of the year. The first appearance in the year takes place about the thirtieth of June, and a second about the fifteenth of October. Every one may be affected by the disease during the epidemic course, Europeans as well as natives. Nevertheless the latter are more frequently attacked, and especially infants, infecting one another, by uncleanly habits and by the flies which play a prominent role in the extension of this malady.

Exploration of the Pupil.

COPPEZ, Brussels. (*Revue generale d'Ophthalmologie*, 28th. February, 1803.) Coppez describes the path of the photomotor reflex and his method of studying the same.

Under the best white light he notes the relative and absolute sizes of the pupils, the direct and consensual reaction of the irides to light and their reactions to accommodation and convergence. To determine whether any pupillary irregularity is due or not to affections of the photomotor arc he makes use of instillations of cocain or of atropin. Cocain, he says, causes dilation by excitation of the dilating fibers, while atropin paralyzes the constrictors. Instillation of cocain into the eye with a large pupil which is due to excitation of the dilating fibres does not give any result. Moderate dilation of the pupils is normal; and maximum dilatation is due to paralysis of the third pair. When the drug is instilled into the eye with a small pupil, there will be little or no result if the miosis is due to a paralysis of the dilator; and there will be but moderate reaction of the iris if the pupil is normal in size. When the miosis is spasmodic in type no result will be produced by the use of cocain, and hence atropin

must be instilled. Feeble dilation of the pupil indicates paralysis of the sympathetic nerve, while moderate dilation signifies a spasmodic miosis.

Lymphadenoma of the Orbit.

ETIENNE ROLLET, Lyons. (*Revue generale d'Ophthalmologie*, 28th. February, 1903.) Rollet reports a case of lymphadenoma of the orbit occurring in a woman of fifty-two years of age. Operative removal of the mass had not been followed by relapse some five months later. Fifteen such cases the author tells us have been reported in all of which the involvement was bilateral. In three of these, he says, there had been no postoperative return. He believes that lymphoid tumors of the orbit are usually situated in the region of the lacrimal gland, and are smooth, hard, not tender or pulsatile, and are relatively mobile.

Exophthalmic Goiter, Resection of the Cervical Sympathetic. Rapid Death.

DESHUSSES, Lille. (*La Clinique Ophthalmologique*, Feb., 1903.) Deshusses reports a case of Graves' disease in a female of forty-one years of age. The disease developed ten years previously after an abortion of a seven months old fetus. The goiter, the exophthalmus, and the tachycardia were marked and there was swelling of the legs. The patient was markedly physically depressed. An unilateral excision of the superior cervical sympathetic ganglion was done. There were not any untoward results until two hours after the operation when the patient became restless, complained of suffocation, and developed a rapid pulse; death following in a few hours' time. The cardiac failure is attributed to the reflex stimulation of the remaining sympathetic of the opposite side.

Bilateral Internal Ophthalmoplegia in a Case of Hereditary Syphilis.

CRUCHANDEAU. (*La Clinique Ophthalmologique*, 25th. February, 1903.) Cruchandau reports a case under the above title. The patient, a child of ten years of age, developed this type of paralysis some four years previously. Under the use of mecurial injections distinct iris reaction

returned and a correction of one and a half diopters of convex, permitted the reading of the finest type.

Affections of the optic nerve or of the ocular muscles, the author says, as a consequence of cerebral involvement in hereditary syphilis, are rare. Lawford, he remarks, has observed ptosis and palsy of the internal rectus muscle in one instance and paralysis of the oculomotor and the sympathetic nerves with inequality of the pupils in another.

Total Peripheral Ophthalmoplegia Seen During the Course of Cancer of the Tongue.

CRUCHANDEAU. (*La Clinique Ophthalmologique*, 25th February, 1903.) In this case postmortem examination revealed a cancerous involvement of the osseous wall and skin of the cranium with infiltration and detachment of the dura mater in the region of the cavernous sinus.

Wounds of the Eye and the Law Governing Occupation Accidents.

A. YVERT. (*Recueil d'Ophthalmologie*, February, 1903.) Yvert reviews the law which was adopted in France in April of 1898 in regard to occupation accidents to the eye as well as the most important papers on this subject which have since appeared.

He states that the law in France requires three certificates or reports. First, one made by the factory superintendent at the city hall during the forty-eight hours immediately following the accident. This certificate must state the condition of the wound at the time of its receipt, and the probable results of the accident (or the time in which it will be possible to determine the result—a revision of the indemnity being possible within three years' time). The latter clause, Yvert says, is, however, insufficient, since definite results may not appear until even twenty years after the injury. Second, greater time may be asked for by the Justice of the Peace some time later if the traumatism is more serious and appears probable to cause permanent, partial or complete incapacity for work. Third, a report must be furnished the court in the capacity of an expert. This expert medico-legal opinion is rarely required within six months' time. In formulating

the same the possibilities of simulation, of exaggeration, and of the occurrence of sympathetic ophthalmitis or of the presence of other disease, are all to be considered.

Independent of all accidents, is to be considered the later false projection of objects which often follows the loss of an eye. This infirmity may seriously affect the patient's ability to successfully follow his business, and perhaps force him to abandon it.

Experimental Study of the Vision of Astigmatics.

SULZER, Paris. (*Annales d'Oculistique*, February, 1903.) By means of photographic plates the author has demonstrated the aberration of the retinal images which are produced by astigmatism, as well as the effects of small pupils in making such images more distinct.

The Ophthalmoscopic Diagnosis of Intravaginal Hemorrhages of the Optic Nerve.

J. GONIN. (*Annales d'Oculistique*, February, 1903.) Gonin ends his article with the following conclusions:

(1) The appearance of a milky haze in the papillomacular region with more or less complete ischemia of the retinal arteries in an eye which has become suddenly blind, does not authorize a diagnosis of hemorrhage into the optic nerve or into its sheath.

(2) There is no reason to conclude that there is an apoplexy of the sheath when profuse hemorrhages are found on the borders of the disc or are situated in the vitreous body. Moreover, retinal hemorrhages, which sometimes accompany intravaginal effusion, are in no way characteristic of the lesion.

(3) A slight degree of papillary stasis is the only ophthalmoscopic disturbance which the facts thus far stated, permit of consideration as a symptom of retrobulbar effusion.

(4) The absence of all ophthalmoscopic symptoms does not suffice to exclude the possibility of a hemorrhagic collection, even an abundant one, in the sheath of the optic nerve.

(5) We are still ignorant of the visual disturbances which are caused by hematoma of the optic nerve sheaths; that is when this hematoma is not complicated by a more

serious lesion such as cases of fracture or cerebral hemorrhage.

Transparent Cysts of the Eye Lids.

AHLSTROM, Gothenburg, Sweden. (*Annales d'Oculistique*, February, 1903.) Ahlstrom reports a case in which a hickorynut-sized cystic tumor had sprung from the outer free margin of the right lower eyelid with two similar smaller ones situated at the outer end of the upper and lower lids of the left side. The cyst consisted of fibrous tissue covered externally and internally with flattened epithelial cells.

Paralysis of Accommodation and of the Velum Palati Consecutive to Mumps.

MANDONNET, Clermont-Ferraud. (*Annales d'Oculistique*, March, 1903.) In the case reported by Mandonnet, a child of nine years developed poor vision especially for near objects, with some difficulty in swallowing. These occurring after a severe attack of mumps. Examination showed an almost complete loss of accommodation with absence of the movements of the soft palate during phonation and deglutition.

Papillitis and Cerebral Tumors.

DIANOUX, Nantes. (*Annales d'Oculistique*, March, 1903.) Dianoux states that papillitis may only be considered as evidence of increased tension. Cases are on record, he says, in which papillitis with symptoms which were considered typical of cerebral tumor were present, and in which the subsequent course of the disease disproved such a diagnosis. Bramwell, he reminds us, has reported such a case in which at autopsy only microscopic lesions could be found. It is evident, he believes, that the various infections which are produced by microbes or their toxins may alter the cerebral tissues or the cerebral spinal fluid in such a way as to produce veritable pseudoplasms which may act as tumor masses.

Whatever may be the cause of the papillitis, he states, as soon as intervention is recognized as necessary, surgical interference alone will preserve the vision. Delay only means increased danger of blindness. Of the oper-

ative procedures there are two—lumbar puncture and craniectomy.

The latter procedure may be of three kinds—simple; that combined with incision of the dura mater (method of Jaboulay); and that with opening of the dura mater and search for the tumor mass, resection and puncture of the ventricles, etc.

Lumbar puncture is the more simple procedure of the two, and is rapid in its action; and while it allows the estimation of the intracranial tension and an analysis of the cerebro-spinal fluid, it is usually transient in its effects. Craniectomy, on the other hand, is a more serious operation and its results are more lasting. Where the diagnosis of cerebral tumor is certain and the neoplasm is situated near the bulb, the author would advise, first, lumbar puncture, followed, if the results obtained are too ephemeral, by craniectomy.

Determination of Refraction by the Scheiner Ametropometer of Le Mehaute.

FROMAGET, Bordeaux. (*Annales d'Oculistique*, March 1903.) This ametropometer Fromaget says, consists of a Scheiner optometer combined with a disc which is similar to that in a Loring ophthalmoscope. These instruments are fitted into a special frame which is called "port-optometer." The apparatus is completed by a special lantern containing a luminous rectangle and luminous cross discs.

The author tells us that if the cross is seen equally distinct in all its branches there is no astigmatism, and it is but necessary to determine the refraction in one meridian. To do this the contrivance is placed in position and the patient is directed to look through the two orifices of the disc, in which are placed green and red glasses, situated at the luminous rectangle, and the direction of which is made perpendicular to the meridian which is wished to be examined. If the eye is emmetropic, only the rectangle will be seen; if there is myopia, homonymous diplopia is present; while if the diplopia is crossed, there is a hypermetropia, the amount of which can be determined by rotating the glass which is necessary to produce a single image in front of the eye. In astigmatism the principal

meridians are measured; the Scheiner optometer being made vertical for the vertical meridian with the luminous rectangle horizontal, and vice-versa for the horizontal meridian. The advantages claimed for the method are its rapidity of work and its simplicity of action.

The Tics of the Eyes.

MEIGE. (*Annales d' Oculistique*, March, 1903.) Meige believes that he may distinguish two forms of convulsive movements, "tics" and spasms. A spasm, he states, is of spinal or bulbospinal reflex arc, resulting from irritation at any point whatsoever. In a tic no such irritation exists, it being a psychomotor disturbance of cortical origin. The primal cause of a tic may be an excitation from the exterior or even a mere idea. The sensation or the idea being renewed, the movement is reiterated, and by repetition becomes a habit. This anomaly can only exist, he says, when there is deficient inhibition power. He urges that a tic may be a clonic one, a tonic one, or a stereotyped movement. By the last is meant those attitudes or movements which though apparently adapted to a definite end are in reality, in the beginning, simply conscious and voluntary, and becoming automatic by repetition: They lack the convulsive character of either the tonic or the clonic varieties.

The tics of eyes, he says, may involve the lids, the extrinsic ocular muscles, or the intrinsic ones. The tonic tics of the lens to which is applied the term "blepharotic," resemble blepharospasm, but unlike them are under the control of the will.

The tics of the intrinsic muscles of the globe may arise from an irritation of a foreign body or from a granular conjunctiva, or they may be purely psychial. They can exist alone or in conjunction with tics of the lids. They may involve one or both eyes. If the movement are frequent, a species of nystagmus is produced. This nystagmic movement may be due to an irritative lesion, or may be purely functional in its origin. The nystagmus of Friedreich's disease is an example of the first, while that of hysteria is expressive of the second.

Tonic tics of the extrinsic ocular muscles may simulate paralyses of the opposing muscles.

Certain cases of strabismus, he says, may also be considered the result of defective habits.

The tics of the intrinsic muscles occur in the form of professional cramp as seen in those subjects who continue long periods of time at close work.

In the case of a young male who stammered, periodical attacks of micropsia, which the author ascribes to an accommodative tic, occurred. The author believes that a true hippiform tic which is comparable to a nystagmiform tic may take place.

The treatment of tics consists in the careful exercise of the ocular movements. This discipline as it were consists of two parts; that of movement and that of immobility. In infants these exercises must be supervised by the parents and the physician. Adults can practice them before a mirror. In children a cure is usually easily attained, while in adults there is a greater resistance, though patience will always ameliorate the condition and often cure the case.

Some Considerations in the History of Kinescopy.

HOLTZ, Christiana. (*Annales d'Oculistique*, March, 1903.) Holtz details the observations of various authors upon kinescopic phenomena. These are the apparent motions which are given to distinct objects by moving a stenopeic slit or hole or other form of objects which partly obstruct the visual field before the eye. By means of an apparatus which is now perfecting, he hopes to make this method of great clinical value.

Two Cases of Obstruction of the Vessels of the Retina, With Ophthalmoscopic and Anatomic Examination (A Contribution to the Study of Thrombosis of the Central Vein).

GONIN. (*Archives d'Ophthalmologie*, April, 1903.) The first case was in a sixty-four year old male in whom vision of the left eye had been failing for months. Six weeks before being seen, there had been a sudden loss of sight after an attack of epistaxis. Upon admission to the hospital, vision was equal to the ability to count fingers at one-half of a meter. The ophthalmoscope revealed the presence of numerous retinal hemorrhages of varying

size: those of the posterior part of the membrane being arranged in a radiating manner. Only narrow vessels were visible, and these appeared to be veins.

A clinical diagnosis of thrombosis of the central vein was disproved by the microscopic revelation of obstruction of the corresponding artery by a proliferating endarteritis. The retinal hemorrhages were presumed to have arisen from the veins. Reimar, the author says, has explained these hemorrhages as being due to an abnormal permeability, the result of a temporary ischemia. He believes this explanation as the most applicable, since in this case the almost complete visual loss followed an attack of profuse epistaxis. Wagenmann, Reimar, Stolting, and Meyerhof, he reminds us, have likewise observed cases in which the clinical diagnosis of thrombosis of the central vein has not been confirmed by microscopic examination.

The second case was in a fifty-five year old female in whom a diagnosis of amaurosis consecutive to facial erysipelas had been made. The ophthalmoscopic picture was that of embolism of the central artery, except for the presence of a relative dilation of the veins, and an extended inferior retinal detachment, with absence of the usual cherry spot in the macula. Microscopic examination revealed the presence of the organized thrombosis of the central retinal vein and of some of its branches, with more recent thrombosis of the arteries.

Sudden amaurosis complicating retrobulbar abscess and especially that which follows erysipelas is not, he says, rare. The fundus changes in such cases may be those of neuroretinitis, or more commonly those of retinal ischemia. The appearance of the veins is variable: they are sometimes contracted, and at other times, dilated and tortuous.

Three theories, he states, are advanced to explain the relation between orbital phlegmon and disturbances of the retinal circulation; I, that of compression (pure and simple) of the vessels in the optic nerve; II, that of destruction of the optic nerve fibers by an inflammation of their substance propagated from an orbital abscess independently of the abscess; and III, that of participation of the retinal vessels themselves in the inflammatory process, with secondary thrombosis and suppression of the lumen of the vessels. Diagnosis of venous thrombo-

sis, the author believes, is almost certain when a swollen and a darkened vessel-branch plunges into the depths of the retina, to appear only at the disc or after its union with a lateral branch. If the dilated and tortuous veins do not show any interruption of the blood columns up to the disc, a diagnosis of thrombosis of the central retinal vein is probable, but not certain.

Determination of Visual Acuity.

LANDOLT, Paris. (*Archives d'Ophthalmologie*, April, 1903.) Landolt's conclusions in regard to this subject are as follows. For the present the principals of Snellen for the determination of visual acuity should be maintained. The letters, figures, lines, points, etc., can be replaced by broken circles constructed in accordance with the same principal. The examination of the visual acuity should be practiced simultaneously with that of refraction at a distance of at least five meters; the results therefore can be expressed in decimals. Optometric examination should be made in a dark room by an electric globe, helped by a silvered parabolic reflector, thus giving a definite degree of illumination.

Sarcoma Developing in a Stump of an Eye of an Infant.

DE LAPERSONNE, Paris. (*Archives d'Ophthalmologie*, April, 1903.) De Lapersonne reports the case of a child of four years of age in whom excision of the anterior segment of the eyeball was made for a corneal staphyloma, the latter condition being the result of a hydrophthalmic process following blennorhea neonatorum.

The immediate effects of the procedure were good, but one year later the stump became irritable necessitating the performance of enucleation of the remaining portion of the eyeball.

Section of the globe revealed the presence of fibrous partitions radiating from the cicatrix to the posterior part of the sclera. Between the fibrous branches were homogenous massings of round cells which contained large, deeply staining nuclei. The vessels were few and for the most part their walls were undistinguishable. No traces of the retina or chorioid could be found. The optic nerve was three times its normal size, and consisted entirely of neo-

plastic cells, the nerve fibres having been destroyed. The absence of neuroglial cells and of the rosette formation excluded, he says, a diagnosis of glioma in favor of sarcoma; which was confirmed by a histologic study of the relapsing orbital growth.

The occurrence of sarcoma in the stump resulting from a partial removal of the globe is, the author believes, quite rare, since he has been unable to find a second recorded case. Several instances are however reported as following other forms of trauma, and more numerous are the cases of sarcomatous involvement of globes which have been long atrophic.

Primary Sarcoma of the Cornea.

SEMPE, Carcassone, and VILLARD, Montpellier. (*Annales d'Oculistique*, April, 1903.) These authors tell us that primary sarcoma of the cornea is of very rare occurrence; only six cases having been reported. To these they add a seventh. A male sixty-five years of age, whose family history was negative had been operated on one year before for an epithelioma of the lower lip. Fifteen years before this, a few weeks after an attack of pain and redness in the right eye, the patient noticed a small growth on the cornea of the same side. During a second painful attack four years later, this mass, which had remained unchanged in size, was cauterized and began to grow rapidly until it covered the cornea. The eye remained quiescent again for ten years' time, although the tumor-mass grew slowly and steadily.

On examination, during a third attack of pain, besides the usual signs of ocular irritation—the cornea was found to have become transformed into a pale and fleshy-like mass, which did not readily bleed. The tumor was distinctly limited to the cornea. Vision was *nil*, and intra-ocular tension was normal. The corneal condition resembled that of pannus crassus, but all causes of such a condition were absent. A diagnosis of malignant growth was made, and the eye was enucleated.

Histologic examination showed the tumor to consist of a fibroplastic plexiform sarcoma.

Two years later there was not any relapse of the ocular affection, but the epithelioma of the lip had returned with submaxillary involvement.

The interesting points of the case are—its rarity; its slow progress; its coexistence with epithelioma of the lip; and the contraindications to cauterization as a method of treatment.

On Spasmodic Retraction of the Upper Eyelids.

CHEVALLEREAU AND CHAILLOUS. (*Annales d'Oculistique*, April, 1903.) The first case was that of a female of forty-two years, in which there was spasm of the elevators of the upper eyelids accompanied by the presence of both the von Graefe's and von Stellwag's signs.

The contractures existed during sleep and under chloroform narcosis. All other motions of the lids were normal. This condition had existed for six months, and was unattended by symptoms of tabes, hysteria, or Basedow's disease.

A similar condition, the author says, has been described by Gowers, who attributed it ordinarily to some irritation in the region of the trigeminus. In the second case a female of forty-six years of age, a similar state on the left side had existed since birth. No cause for it was apparent.

Considerations on Simulation of Concentric Contraction of the Visual Field.

BICHELONNE. (*Annales d'Oculistique*, April, 1903.) Bichelonne reports a case of simulation of concentric contraction of the visual fields in a recruit eighteen years' of age. Vision at the time of the patient's entering the army was normal. A few weeks later he was examined for typical attacks of somnambulism with the result that concentric contraction of the fields of vision with a reduction of the vision of the left eye to six-tenths of normal was discovered. Subsequent examination of the visual field by others showed a still more marked lessening with a distinct inversion of the color areas. Without any apparent reason vision in each eye had fallen to one-half.

These unaccountable variations led to a suspicion of simulation, which the patient at last admitted. Examination two months later showed both normal color and visual perception.

Tardy Hereditary Syphilitic Gumma of the Conjunctiva.

SPECIALE-CIRINCIONE, Sienne. (*Revue generale d'Ophthalmologie*, 30th April, 1903.) Speciale-Cirincione reports the following symptoms in a fifteen-year-old boy: Resting upon, and covering the outer half of the right eye, there was a fleshy gelatinous-like mass which arose from the bulbar conjunctiva. The tumor which was smooth, moved freely on the globe. It was copper-colored in appearance.

Except for a slight crossed diplopia on external rotation there were no other ocular signs. The preauricular and cervical glands were swollen and the tonsils were much enlarged. The father and two older sisters of the patient had died of tuberculosis. Just before marriage the father had contracted syphilis.

Because of the enlarged cervical glands and the failure of the iodide treatment the tumor was diagnosed as tubercular and was removed. The absence of tubercles, of caseated points, of tubercle bacilli, and the negative results of inoculation, disproved any tubercular origin of the growth; while the presence of a richly vascular tissue, of elemental cells in various degrees of development, and of a perivascular cellular sheath, indicated the presence of a gumma of the conjunctiva. Shortly after the operation the swollen tonsils were removed: Then the palatal arch began to break down, but under specific treatment the process stopped.

At present writing, six years later, the patient is well.

Two Cases of Isolated Complete Paralysis of the Oculomotor Nerve Following Injury of the Skull.

DESGOUTTES and MULLER, Lyons. (*Revue generale d'Ophthalmologie*, 30th April, 1903.) Desgouttes and Muller report two cases of trauma to the skull in which, without other motor disturbance or other sign of involvement of the base of the brain, an isolated paralysis of the two oculomotor nerves developed. Each eye recovered in a few weeks' time.

The mechanism of the production of paralysis is presumed by these authors to have been due to a hemorrhage taking place into the sheath of the nerve.

Subretinal Cysticercus in the Region of the Macula.

GALEZOWSKI, Paris. (*Recueil d'Ophthalmologie*, April, 1903.) A twenty-year-old man, a saddler, had complained of poor vision with the right eye for a period of eighteen months, the center of the field being most affected. Examination revealed the presence of a slight dilation of the pupil. Vision with the eye was reduced to one-tenth.

The ophthalmoscope showed the presence of a glistening white round body about the size of the optic disc in the macular region. At the superior part of the vesicle arose a cylindrical column with a peripheral head. This neck and head were mobile, elongating and advancing into the vitreous humor from the retina. The remainder of the fundus was normal. The author proposed to remove the cysticercus by a division of the sclera and chorioid at the base of the parasite.

Two Cases of Sympathetic Ophthalmitis.

VALOIS, Moulins. (*Recueil d'Ophthalmologie*, April, 1903.) Valois reports two cases of sympathetic ophthalmitis in which repeated injections of a one per cent. strength solution of cyanide of mercury into the orbit of the enucleated eye were followed by marked improvement, the visual power of the sympathizing eye returning to normal. These injections, he says, were very painful and were accompanied with edema of the lids and corresponding side of the face. Granting the infectious nature of sympathetic ophthalmitis, he believes that the local use of mercury in this manner is the most rational form of treatment.

Concerning the Operation for Total or Partial Trichiasis.

A. TERSON. (*La Clinique Ophthalmologique*, 10th April, 1903.) Terson prefers the method of Panas as an operative procedure. To avoid an excessive effect, as may happen in lids which are not much thickened or are of large transverse dimensions, the author has adopted the modification of Panas' method which has been recently described by Thilliez, viz: leaving a small central segment of the tarsus intact. For partial trichiasis of slight degree, the author attempts destruction of the misplaced cilia by means of a galvano-needle or an actual cautery needle.

On Traumatisms of the Cornea.

ROQUES, Cannes. (*La Clinique Ophtalmologique*, 10th April, 1903.) In some cases of corneal traumatism not only infective but also trophic phenomena are produced. The latter may, in certain cases, the author says, be the only cause of irritation. In these, antiseptic treatment may be futile, while a treatment which is intended to modify the vasomotor system will produce rapid results.

The author reports two cases in which after failure of the antiseptic treatment, rapid and permanent relief followed the daily ingestion of thirty grains of aspirin. Aspirin as an analgesic and specific, he says, has also given him good results in those cases of ocular complication which are commonly known as rheumatic, as in glaucoma and episcleritis.

Cysticercus of the Eye (Retrolenticular).

GUIOT, Paris. (*La Clinique Ophtalmologique*, 10th April, 1903.) Guiot reports a case of cysticercus in a thirteen and a half year old boy. Some months previously the patient noticed that on closing his right eye he was at times unable to see with its fellow. Examination showed a vision which varied from one-sixth to one-half normal. Just posterior to the crystalline lens, between this and the vitreous body, a vesicle could be seen; its head moving parallel to and just above the horizontal meridian. The appearance of the vesicle was typical of that of cysticercus, resembling a bubble of air as seen in microscopic preparations. The medical treatment of these cases the author says is useless. Surgical intervention is advised only in order to avoid the accident of iridochorioiditis.

The Influence of the Marine Climate and Saline Baths on Certain Ocular Affections.

JOCQS, Paris. (*La Clinique Ophtalmologique*, 25th April, 1903). The predisposition of those children of the lymphatic diathesis and of those subjects who are living under poor hygienic surrounding to phlyctenular keratitis is, Jocqs says, well known. A temperate climate at the seaside, so often recommended for this type of patient, is of great value in phlyctenular keratitis, and also in many cases of interstitial keratitis which undoubtedly results

from other dyscrasias than that of syphilis, especially the scrofulous and the lymphoid types.

Affections of the uveal tract are almost exclusively the bane of adults. Iritis is largely of syphilitic or rheumatic origin. Cases of chronic iritis whose origin is unknown, however, occur. In females particularly, a serous form of iritis occurs between age of puberty and the thirtieth or fortieth years of life. These types of irites are often dependent on retro ovarian disturbances. In such cases, after surgical treatment, combined with the use of mercurials and iodides, general tonic treatment must be employed—of the latter form of therapy the seaside and salt baths are the best.

Two New Painless Preparations of Silver: Argyrol; Collargol; Their Indications in Ocular Therapeutics.

DARIER, Paris. (*La Clinique Ophthalmologique*, 25th April, 1903.) Darier has employed argyrol in two-to-five, ten, and twenty-five per cent. strength solutions in dacriocystitis with good results. He has also used the last strength solution in ophthalmoblenorrhea with great benefit.

Collargol, he has likewise found, is a silver salt whose use does not occasion any pain. The author has employed it with benefit in a one per cent. strength solution in dacriocystitis. He has also used it in one-to-one-hundred, one-to-five hundred, one-to-one-thousand strengths solutions in the form of subconjunctival injections, but the cases are still too limited for him to permit of publication.

The Operation for Strabismus by Musculo-Capsular Advancements.

JOCQS, Paris. (*La Clinique Ophthalmologique*, 10th May, 1903.) Jocqs first does a moderate tenotomy of the antagonist, using a pair of forceps instead of a hook to elevate the tendon. A silk ligature with a fine needle at each end is fixed to the globe near to the cornea, including its grasp the conjunctiva and the episclera. The conjunctiva is then undermined over the entire operative field. With a forceps the tendon is grasped just back of its insertion and, with its capsule, is detached from the globe, the

amount of the dissection depending on the effect which is desired. The forceps are now replaced by an advancement forceps and the needles of the set suture are passed through the muscle from beneath at a greater or less distance from the tendon according to the effect which is desired. The muscle is advanced by the forceps and the ligature is tied. Two lateral sutures including only the capsule and the conjunctiva are then passed into position. A double bandage is worn until the sixth day, when the sutures are removed.

Three Observations on the Movements of Refraction of the globe (Nystagmus Retractorius).

KOEBER, Magdeburg. (*La Clinique Ophtalmologique*, 10th. May, 1903). The first case was seen in a neurasthenic male of twenty-one years of age. Six years before vision with the left eye began to fail and divergence developed. Examination showed a divergent strabismus of thirty degrees in the left eye. Vision with that eye with correction equalled one-fourth of normal, while vision with the right eye was normal. Symmetrical paresis of superior rotators of the globes, paresis of the associated lateral rotators, and a reflex paralysis of the pupils were present. Associated with attempts at rotation of the eyes upward pronounced movements of retraction of the globes took place. Movements in other meridians were associated with nystagmiform lateral motions.

The author is inclined to believe that the condition was one of congenital anomaly in spite of the history; otherwise, he says, it must be ascribed to a disseminated sclerosis or to a chronic superior polyencephalitis.

The second case was that of a forty-eight year old male who developed a transient diplopia following influenza. There was a paresis of the oculomotor nerves associated with nystagmic movements in all meridians and with movements of retraction of the globe during upward rotation, these being especially marked at the beginning of the action. Vision with each eye was normal. The two fundi were slightly congested. In this case, the author says, the paresis was presumably one of peripheral type due to influenza.

The third case was seen in an eighteen year old patient

who on the right side had a phthisical stump which during rotation downward or outward was thrown into a series of retraction movements due the author believes to pathological fixation by conjunctival cicatrices.

Favorable Influence of Collargol upon Infectious Ulcers of the Cornea.

LELOUTRE, Troyes. (*La Clinique Ophtalmologique*, 10th. May, 1903.) Leloutre reports three cases of infectious corneal ulceration associated with hypopyon in which the local use of irrigations of bichloride of mercury (to which were added rubbings of a fifteen per cent. strength ointment of collargol on the eye lids and the temples and in the axilla or in front of the elbows fivetimes a day), yielded brilliant results.

ABSTRACTS FROM GERMAN OPHTHALMIC
LITERATURE.

BY

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(Quarter ending June 30, 1903.)

Yellow Eye Glasses for Shooting.

(Extracted from *Wochenschrift für Therapie und Hygiene des Auges*, No. 20, 1903.) The author of the article agitated this question several years ago, and as a result of his efforts a number of batteries of artillery equipped their cannoneers with yellow glasses. Exhaustive experiments were made in all sorts of weather and under different degrees of illumination simply as control measures. Reliable data were obtained showing that in any kind of weather and light shooting was $\frac{1}{3}$ more accurate with the yellow glasses. The artillerymen could see the mark far better through the yellow glasses and the light was much less disturbing. These results were especially noticeable in a fog, in the dusk, and when the mark for other reasons was less clear. On the basis of these results it is suggested that not only artillerymen but all arms of the service be provided with such glasses.

Fluorescein and Diseases of the Cornea.

V. HIPPEL. (*Von Graefes Archiv für Ophthalmologie*, LIV Bd., I Heft.) The results of Von Hippel's investigations show that the green coloration of the cornea only occurs when the cornea is diseased. In hereditary

parenchymatous keratitis beginning in the corneal border and continuing with vascularization, the coloration with fluorescein is not seen in the earliest stages which indicates, he thinks, that the cause of the clouding does not appear to be in the endothelium. In the rarer forms of central clouding there may be some endothelial involvement. In keratitis profunda as well as in keratitis annularis in the earliest stages the fluorescein test is positive, which indicates that there is here an involvement of the endothelium. The cloudings of the cornea which are seen in the iritis and irido-cyclitis show the fluorescein stain, while the precipitates which are situated in the clear cornea show no green coloration. In the corneal clouding which is seen after cataract extraction there is no green coloration; but this may be explained by the fact that the fluorescein was not dropped in for twenty-four hours after the operation. Cases of parenchymatous keratitis clouding in infants were associated with endothelial changes which were caused by either mechanical agencies or through an endogeneous disease of the cornea. The clouding of the cornea in glaucoma gave positive results. This disappeared however when the tension returned to the normal. This alteration in the endothelium is not to be attributed to increased tension, but to noxious substances retained in the anterior chamber as a result of the high tension.

Adrenalin and Atropin.

MENGELBURG, R. (*Wochenschrift für Therapie and Hygiene des Auges*, No. 32, 1903.) The author lays stress upon a fact which hitherto is unknown, namely, that a combination of adrenalin and atropin is apt to produce symptoms of atropin poisoning, even in small quantities. In several cases in which this fact was demonstrated there was no idiosyncrasy for atropin, for it was quite well borne when not combined with adrenalin. He explains the result as follows: Through adrenalin the vessels of the mucous membrane of the canaliculus are much contracted and thereby the mucous membrane is made much thinner and the canal more patent, and in this way a bigger opening is made through which the atropin can pass into the tear duct and from thence into the nose. He advises great caution in the use of these two products together.

The Employment of Three per cent. Solutions of Scopolamin
for Mydriasis and of Yohimbin as an Anesthetic
for the Eye.

SALOMONSOHN, H. (*Wochenschrift für Therapie und Hygiene des Auges*, No. 28, 1903.) The author has been much impressed with the good results which he has recently obtained in cases of iritis and keratitis whenever indeed there is spasm of the sphincter pupillae, and he advises the use of the product in this strength, provided that the lower lid be slightly everted so as to turn out the punctum and the head turned down toward the shoulder so as to allow the drop to roll out over the external canthus. A solution of this strength according to Salomonsohn is equal in its action to 15 per cent. solution of atropin. One drop of this solution is sufficient to keep the pupil in mydriasis for a day or even longer. The same author goes on to speak of the new anesthetic yohimbin. It was discovered by Magnani in Turin and was used by him in one per cent. solutions. There is first some burning, not unlike what is produced by cocain, associated with a certain amount of pericorneal redness. It is remarkable for the promptness of its action, for it anesthetizes as soon as it diffuses. If dropped on the cornea it produces anesthesia in one minute, and the anesthesia lasts at least half an hour. He did not find any sluggishness of the pupil but where the eye was free of irritation there was a slight mydriasis which disappeared in about twelve hours. The light reaction is preserved. Where the eye is in an irritated condition mydriasis is absent. It seems to affect the accommodation, if at all, to a very limited extent.

The Full Correction of Myopia.

BYLSMA, R., Middleburg, Holland. (*Wochenschrift für Therapie und Hygiene des Auges*, November 27, 1903.) The author analyzes the myopia in twenty cases of young persons where the myopia was of six dioptries and under and where he had made a full correction of the myopia. He was able to see these cases from time to time, and to ascertain whether there had been any increase. Four remained stationary and these four were individuals who had been taken from close work and not allowed to study. Another case had been forbidden to either read or

to sew. In all those who remained at school or who kept on with fine work there was an increase in the myopia. They were controlled at the expiration of three years and a half and there was an increase of about 1.25.

The Explanation of the Pain in Photophobia.

BJERRUM, J., Cöpenhagen. (*Centralblatt für praktische Augenheilk.*, April, 1903.) Nagel it will be remembered makes the statement that the pain in photophobia is due to the contraction of the pupil when the light strikes the eye. Bjerrum however is not of this opinion. He cites the well known fact that superficial lesions of the cornea are the cause of the highest grade of painful photophobia while the deeper forms of keratitis associated with uveitis seldom give rise to painful photophobia. Secondly the pain in photophobia is more intense than after the instillation of eserine in the normal eye when the pupil is at least quite as small. It is by no means certain that the pain after eserine instillation is to be attributed to the contraction of the pupil. Thirdly we often see very painful photophobia in pupils which have large and very immobile pupils. Fourthly the pain and the photophobia are really one sided phenomena in the great majority of cases and they are only seen when the light falls into the affected eye. He has examined several cases of foreign body in the cornea in which the photophobia was marked and he found that the pain when the light fell into the affected eye was not diminished when the pupil was dilated with either atropin or homatropin and on the other hand these patients felt no inconvenience when the light fell into the unaffected eye. These two points seem sufficient to show that it is not simply the contraction of the pupil which produces the pain in these cases. He is of the opinion that this pain is reflex in character, traveling from the optic tracts to the sensitive tracts of the eye and its surroundings. These sensitive tracts on account of the inflammation in the eye are in a hyperesthetic and painful condition and in this condition irritation of the optic nerve which under ordinary circumstances would cause no pain immediately produces pain or exaggerates what pain there is already present. He thinks that some such explanation probably accounts for pain felt in the so-called

physiological photophobia. This interpretation is supported by the fact that cocain relieves these conditions more promptly than atropin because of its anesthetic influence upon inflamed nerve endings.

Ring Abscess of the Cornea.

FUCHS, Vienna. (*Archiv. für Ophthalmologie*, LVI. Band. I. Heft.) The author has made an anatomical examination in nine cases of so-called ring abscess of the cornea. He defines ring abscess of the cornea as an inflammation which appears suddenly, which follows the limbus of the cornea and which after a few days generally leads to suppuration of the cornea and panophthalmitis. He goes on to show that the infiltration consists of pus cells and the infiltration runs around the cornea concentric to the border, and about 1—1.5 mm. from the limbus. In old cases it can lie a little further in the cornea, the ring however always remains near the limbus. The cells which comprise the ring of infiltration comprise two zones. I. The first zone corresponds to the middle and superficial lamellae of the cornea and the second zone corresponds to the deepest layers next to Descemet's membrane. He calls them the anterior and posterior zones of infiltration. The anterior zone is always the seat of the chief mass of pus. The posterior zone consists of a collection of cells in the most posterior layers of the cornea, lying just in front of Descemet's membrane. We have as the sources of the anterior zone the bloodvessels of the limbus and the anterior ciliary vessels. For the source of the posterior infiltration zone we have a route through Descemet's membrane from the anterior chamber or they can wander in the middle of the cornea from the border of the cornea and in front of Descemet's membrane. Bacteria were found in all the cases in the free exudate of the anterior chamber and often in the posterior chamber and vitreous space. He sums up his anatomical findings by characterizing the condition as one in which we have a ring-shaped purulent infiltration of the periphery of the cornea and where the posterior layers which are shut in by this ring are necrotic. The suppuration extends into the deeper parts of the eye and leads to panophthalmitis. Bacteria in large numbers are to be found in the masses

of the exudate. He draws some interesting points of difference between ring abscess and serpent ulcer. Clinically serpent ulcer develops from a superficial injury of the cornea and ring abscess from either a perforating wound or without any injury. Serpent ulcer rears itself around the injured point as a centre while the position of the ring abscess is always independent of the position of the injury. The serpent ulcer extends from the middle to the periphery while ring abscess extends from the periphery to the middle of the cornea. Serpent ulcer leads exceptionally to panophthalmitis while ring abscess as a rule to the latter. Anatomically there are the following points of difference. In serpent ulcer we have a purulent infiltration of the borders of the small ulcer while in ring abscess we have no such thing as infiltration of the borders of the wound. Transverse sections through the cornea show wedge-shaped infiltrations in the walls of the ulcer in cases of serpent ulcer with the point directed to the cornea while in case of ring abscess the point is directed to the middle of the cornea. This corresponds to the opposite directions of the infiltration process taken by the two forms of infiltration. In serpent ulcer the wedge-shaped infiltrate of the border of the ulcer is the chief seat of the bacteria while in ring abscess the ring infiltration never contains bacteria. In both processes we have necrosis of the deep corneal layers. In serpent ulcer this necrosis proceeds from the anterior side of the cornea while in ring abscess it proceeds from the other side of the cornea. In serpent ulcer the exudate in the anterior chamber is free of germs while in ring abscess it is rich in bacteria which accounts for the frequency of panophthalmitis in the latter affection. Panophthalmitis is an exceptional occurrence in serpent ulcer. The usual organism in serpent ulcer is the pneumococcus while in ring abscess various bacteria are found.

Glaucoma.

WAHLFORS, (*Archiv. für Augenheilkunde*, Bd. 47, S. 7—40.) The author holds that high tension and glaucoma are not identical. All forms of glaucoma have more or less the same symptoms in common. In all forms we have a symptom which is more less pronounced, the low-

ering of light perception which is caused by by malnutrition of the rods and cones, which receive the material for their nutrition from the chorio-capillaris through the medium of the pigment epithelium of the retina. He agrees with Fuchs and Goldzieher in thinking that the primary cause of glaucoma is some disease of the chorioid. If this disease is localized in the chorio-capillaris we have the picture of chronic glaucoma with the slow decline in vision without marked elevation in tension. If the disease however is more marked in the muscular layer which is the supporter so to speak of the intraocular tension, we have the veins in the location compromised in their functions and the outflow is obstructed and we have the type of acute glaucoma to deal with. The stasis explains the hyperemia of the conjunctiva bulbi and of the ciliary body. The pressure upon the ciliary nerves explains the hyperesthesia of the cornea, the dilatation of the pupils and the sluggishness of the latter; and it explains the sudden diminution in vision as well as the shallowing of the anterior chamber. The chorioidal lesion of course is not to be influenced and the therapeutics should be systematic, iridectomy, sclerotomy, eserine and a proper observance of circulatory conditions. He does not believe in operating immediately for acute glaucoma, but first in the instillation of eserine every quarter of an hour, kept up day and night.

Central Retinal Changes in Mental Diseases.

KUHNT and WOKENIUS. (*Zeitschrift für Augenheilkunde*. February, 1903.) The authors examined five hundred and eleven individuals and of these one hundred and forty-three showed changes in the eye grounds. Four times pronounced atrophy, once choked disc, four times neuritis optica without reaching the grade of choked disc, once neuro-retinitis, eleven times marked hyperemia, twelve times marked palor of the nerve without any further evidences of atrophy, seventeen times marked palor of the temporal half of the disc, four times retinal hemorrhages, once retinitis punctata albicans, three times connective tissue changes in the retina, twenty-seven times Uhthoff-Klein cloudings in the retina, thirty-four times disc-shaped cloudings in the macular region, forty-two times foveal changes, three times central chorioido-reti-

nititis, fourteen times central chorioiditis, thirteen times central myopic chorioiditis, three times glaucoma simplex. As regards the special changes in the central part of the retina we have two categories, first where there is a marked clouding of the retina of the entire macula lutea, and second where there were distinct round reddish yellow spots which surrounded and took in the fovea. It was interesting to note whether this spot in its development and character bore any relation to certain forms of mental disease. It was observed nineteen times in paranoia, and dementia, twice in paralytic dementia, twice in periodic dementia, once in senile dementia, seven times in mental disturbances associated with epilepsy, twice with melancholia, four times in mania, twice in imbeciles, and once in idiocy. In all the cases the urinary examination was negative. In all the cases where there was disc-shaped clouding of the macular region and the yellow spot at the fovea only one case showed anatomical changes in the papilla and that was in a paralytic with well advanced optic nerve atrophy. There was never noted in the periphery of the eyegrounds anything which could be attributed to the mental diseases. Scotomata as a rule were absent and the visual acuity as a rule was unaffected to any great degree. The work at least suggests the importance of examining the macular region and fovea of individuals affected in this way.

The Eye Symptoms in Diseases of the Pons and Medulla Oblongata.

HIRSCH, R. (*Zeitschrift für Augenheilkunde*, April, 1903.) The author has made an interesting study of this class of cases and comes to these conclusions. If we separate abducens paralysis and a choked disc from the other ocular symptoms which were observed (and these by the way are not in themselves local symptoms of disease of the medulla) there remains only one other ocular focal symptom for tumors of this region. Undoubtedly in the presence of bulbar symptoms choked disc (excluding external diseases) can help to a diagnosis of tumor of the medulla oblongata. It is found in one-third of the cases and no doubt more accurate and frequent examinations will demonstrate its presence in advanced stages,

thus making easy the very difficult diagnosis of tumors of this region. Almost as frequent as choked disc is the loss of light reflex and presence of widely dilated pupils which conditions one might think attributable to the choked disc but in fifteen per cent. of the cases a normal eye ground was found. Bach and Meyer have been found on the basis of numerous investigations that there was a close connection between the pupillary reflex and the medulla oblongata. They assume the existence of a reflex center in the medulla which limits the pupillary reaction and when there is a loss of light reflex it is probable that we have an irritation of this centre and when the pupillary reaction is preserved we must either have this intact or completely destroyed. We have then in diseases of the medulla choked disc and loss of pupillary light reflex paralysis of the abducens, ptosis, exophthalmus, and paralytic strabismus, but it is true that not one of these symptoms is pathognomonic for diseases of the medulla oblongata.

The Sclera in Panophthalmitis.

POLLACK. (*Zeitschrift für Augenheilkunde*, March, 1903.) The author has made a number of observations and has noticed that the sclera of eyes which have been removed for panophthalmitis is not stained by eosin except in its outer layers while the inner layers show a distinct bluish stain. The author regards this as typical of suppurative iridochorioiditis since it was observed in fifteen eye balls which were subjected to anatomical examination and has never been observed under other circumstances. He offers no explanation for this condition.

Therapeutic Action of Subcutaneous Injections of the Iodide of Sodium.

SHIELE, A. (*Wochenschrift für Therapie und Hygiene des Auges*, No. 45, 1903.) The author generally used a five per cent. solution and injected doses of 0.05 g. in the temple region. There was generally some pain which lasted considerable time, at the seat of the injection. Sometimes a few drops of an acain solution were added to help ameliorate the pain. The injections were made either daily or every two or three days and after ten injections a

pause was made of say from four to six days. The author has never made more than twenty-five injections in one individual. In the first class of patients there was atrophy of the optic nerve. The vision in the first case went up from the ability to count fingers in one and a half metres to four metres. The second case was where the vision went from 3/8 to 3/6. The next case was one in which the vision went from the ability to count fingers at one metre with the right eye to three metres and with the left eye from fingers at 30 cm. the vision went up to 1 m. Two months later the vision in the right eye had gone back to 2 m. while the vision in the left eye was the same. Two other cases are reported in one of which the result was excellent. He then relates three cases of neutritis retrobulbosa which were benefited and one case of facial paralysis which latter was cured.

Experimental Investigation on the Localization of Endogenous Injuries of the Eye, Especially those of an Infectious Character. Endogenous Iritis and Chorioiditis and Sympathetic Ophthalmia.

STOEK, Woefgang. (*Klinische Monatsblätter für Augenheilkunde*, February, 1903.) The author injected into the vitreous the toxins of the bacillus pyocyaneus, bacillus coli communis. Severe irido-chorioiditis followed with infiltration of the optic nerve sheaths of this eye but no participation on the part of the other eye. He injected a bouillon culture of pyocyaneus into the ear vein of a rabbit. He also irritated eyes by either injecting croton oil into the vitreous or by implanting a small piece of either copper or silver in the anterior chamber. He also injected the ear vein of a rabbit with bacillus pyocyaneus without irritation of the same eye. In a large percentage of cases metastasis occurred even in the eyes which had never been irritated. In moderately severe infections and where the eye had been much irritated metastases were numerous. When an eye was irritated aseptically there was never observed any pathological change (microscopic) in the fluid in the anterior chamber of the other eye. He injected tubercle cultures into the ear veins of twelve rabbits. In all the cases without exception there was tuberculous iritis and chorioiditis.

Retinal Detachment.

Report of discussion which took place in the Hamburg Medical Society, April 1st, 1903. (*Wochenschrift für Therapie und Hygiene des Auges*, June 11, 1903.) The discussion seemed to concern chiefly Deutschmann's method of treating retinal detachment. Herschel spoke strongly against the method and stated that he obtained far better results by rest in bed, compress bandage and daily injections of pilocarpine. He is of the opinion that Deutschmann's method is apt to cause a disturbance in the nutrition of the eye. Salomon, too, spoke of the prognosis as being exceedingly bad in spite of Deutschmann's reports to the contrary and he did not believe that the method had been shown to be satisfactory inasmuch as none of the text books mentioned it. Deutschmann replied that his method in his hands was a decided success considering the fact that during his ten years of service in Heidelberg he had never seen a case of cure with other methods. Dor in five hundred cases had seen no cures. He only operated in cases as a last resort. The fact that his method is not mentioned in literature simply indicates that the author has not tried the method. Herschel expressed himself in the strongest language against the recent reports of Deutschmann that half of his cases had been cured. Liebrecht stated that in his opinion Deutschmann's operation not only did no good but harm as is evidenced by the frequency of subsequent vitreous opacities. A great many of the cases which were reported by Deutschmann as cured proved not to be so. There seems then to be a general scepticism as to the value of the operation. Franke also spoke very emphatically against the treatment and urged as special objections, the danger of infection, hemorrhage and the production of cataract. According to Franke the spontaneous cure of this affection is not such a rare occurrence after all. Pagenstecher has observed it in 80 per cent. of cases. (*Sic!*)

A Contribution to the Pathology of Affections of the Corneal Endothelium

GRAFLIN, ARTHUR. (*Zeitschrift für Augenheilkunde*, April and May, 1903.) The work is an exhaustive clinical and experimental one, the details of which may be

omitted. It is clear however that the condition of the endothelial layer plays just as important a role in the physiology and pathology of the cornea as the epithelial layer perhaps an even a more important part. For example parenchymatous keratitis in its various forms, clouding of the cornea after secondary glaucoma, iritis and iridocyclitis depends upon an affection of the endothelium. In the future then we must consider in our therapeutics what will tend to a regeneration of the endothelium and for this purpose the author and others in his clinic have observed the particularly favorable influence of Fowler's solution. It seems indeed to exert almost a specific influence. The following conclusions are drawn. In parenchymatous keratitis the endothelium is always involved. A disease of the endothelium is always responsible for interstitial cloudings of the cornea in iritis, secondary glaucoma and iridocyclitis.

On the Argentum Catarrh of the New Born.

BISCHOFF, C. W., Bonn. (*C. Bl. f. Gyn.*, 1903, No. 10.) Although Credé's method is unanimously acknowledged as an excellent prophylactic, its irritating influence has often been emphasized. Cramer, e. g., observed the latter in 96 per cent. The author therefore studied the reaction of Credé's method, carried out strictly according to Credé's directions, on 100 newborn children of the University Obstetrical Clinic at Bonn. The degree of irritation was measured by the following secretion: No severe reaction occurred in any case. On the first day it was moderate in 20, slight in 21, minimal in 38, none in 20. On the second day slight in 6, minimal in 22, none in 72; on the third day slight in 1, minimal in 10, none in 89; on the fourth day none in 100.

From this B. infers that the severe irritations observed by Cramer must be due to faulty methods. If, however, further experiences with 1 per cent. solutions of nitrate or acetate of silver should prove the latter to be just as effective as the 2 per cent. solutions, they would be preferable, on account of the slighter reaction of the eyes after their use.

On the Pathogenesis of Acute Transient Amaurosis in Lead Colic, Uremia and Eclampsia.

PAL, J., PROF., Wien. (*C. Bl. in Med.*, 1903, No. 17.)

The transient amaurosis in these diseases is not to be attributed to uremia, as even, in clear cases of the latter it does not immediately follow the nephritis, but is due to an acute or subacute increase of vascular tension. To strengthen his assertion P. reports a few cases with tonometric registrations.

On the Pathology of Old Peripheral Paralysis of the Facial Nerve.

BERNHARDT, M., Berlin. (*Berl. Klin. Woch.*, 1903, No. 19.) It has been clinically ascertained that in the great majority of cases, recovered from severe peripheral paralysis, the voluntary conduction is sooner reestablished than the electric excitability of the nerve, especially in its portion peripheral from the point of lesion. While Placzek showed that in some cases of old facial palsies the reverse takes place in all the branches of the facial nerve. B. reports five cases of facial paralysis with relative recovery in which the restitution of the electric excitability below the lesion occurred only in the so-called upper twigs of the facial nerve (especially corrugator and frontalis), but no voluntary, or electric reaction from above the lesion, could be elicited. B. repudiates the assumption of an axile neuritis in these cases by Placzek, since we know that axis cylinders without or with defective medullar sheaths may persist and have functional power, but that no nervous function can be performed by medullary sheaths alone without axis cylinders. A periaxial neuritis, damaging only the medullary sheath, might be more likely.

An explanation of the phenomenon may perhaps be found in the fact, established by experimental researches in young animals by Bethe, that if the reunion in neurotomies is prevented, still an anatomical and physiological regeneration of the peripheral branches take place.

Remarks on Injuries of the Eye by Chemicals.

SCHWARZ, E., Aussig. (*Beitr. z.*, Aug., Heft. 55.) S. sums up the results in the treatment of 75 cases of injuries from chemicals, which were rather favorable. The chief point is, to use, as soon as possible, a chemical antidote, and then energetic irrigations with water. When

the offending agent is an alkali he used acetic acid 1 per cent., or diluted hydrochloric or citric acids, when an acid, 2 per cent. solutions of carbonate of soda, when a salt, oleum olivarum.

The Cysts of the Conjunctiva.

CIRINCIONE, G., Siena. (*Ibidem.*) After a review of the literature, C. communicate his own researches on acquired cysts of the conjunctiva, studied on material, collected in the clinics of Naples, Leipzig, Berlin, Paris and from his own practice. He subdivides the acquired cysts into superficial or conjunctival, and first considers the superficial serous cysts of the conjunctiva and fornix. The largest had the size of a small bean, some were multilocular. Their wall consists of a structureless membrane, with two strata of epithelium. The contents vary, mostly it is a hyaline and mucous secretion from the cells of the walls. According to C.'s investigations their genesis differs from that so far supposed, as they develop from the glandular crypts of the conjunctiva which he found predominantly in the lateral portions of the fornix, especially behind the tarsus, in absolutely normal conjunctiva.

The unusual contents found in almost all these cysts render it probable that foreign bodies (dust, coal, nitrate of silver, parasites) having entered the cysts, produce, by irritation, abnormal secretion with an increase of volume.

Serous epithelial cysts of the ocular conjunctiva are less frequent. C. observed them only in four cases, and gives an histological report of two of them, without being able to furnish an explanation of their pathogenesis. Superficial, opaque, grey, small cysts occur mostly at the convex border of the tarsus and generally disappear after expression of their contents. They originate in the glands of Krause, and were observed during the inflammatory stage of trachoma.

Another kind of small round cysts of the size of a pin's head, greenish, opaque, contained detritus and micrococci and were transformed crypts of the conjunctiva.

C. calls spurious cysts parts of the conjunctiva which are created by papillary exuberances and foldings of the

surrounding conjunctiva and thus, by enclosure, lose their contact with the atmosphere.

The profound or subconjunctival cysts are divided into cysts of the glands of Krause and into parasitic cysts (filaria and cysticercus). The former occur at the upper or lower fornices, especially in their lateral portions and are always oviform with larger transverse axis, have smooth walls, are sometimes bilobular, and have a bluish light color. They are frequent in young people, sometimes children, rare in old people, and occur mostly in cases of trachoma or chronic conjunctivitis. Their contents are fluid, mixed with epithelial cells, detritus of leucocytes and remnants of the glandular secretion.

Lymphatic cysts (lymphectasiæ) are observed only on the ocular conjunctiva with which they are movable, have no characteristic form, never exceed 3 mm. in size, have a luster like pearls, are very transparent and never occur singly. Their genesis is not known.

C. does not believe in the occurrence of traumatic cysts. Five figures in the text and 46 very good half-tone drawings on 15 plates illustrate the histological conditions.

Carcinoma of the Lids.

MAYEDA, Uzuhiko, Nagoya, Japan, with 2 plates with photogravures and 3 figures in the text. (*Ibidem*) Heft 56. M. reports the clinical histories of 44 cases of carcinoma of the lids from the eye clinic of Prof. Vossius at Giessen, partly with anatomical findings, and, in tabular form, 181 cases from the incident literature. Then follow discussions of the clinical pictures, according to age, sex, occupation, frequency, localization, growth, form, generalization, etiology, prognosis, therapy and a more minute anatomico-pathological study of the reported cases, with a bibliography of 255 members, occupying all together 135 pages.

The anatomico-pathological resumé is that only few carcinomata of the lids and surroundings of the eye consist of pavement epithelium, starting from the epidermis. The majority form a group of epithelial tumors of more or less glandular structure and almost always lacking cornification. Probably they originate from the sebaceous glands of the skin and hairs and clinically correspond to rodent ulcer. In his cases carcinoma of the lids occurred most

frequently between the 46th and 70th years, affecting men and women in the proportion of 58:42. Lack of cleanliness furnishes a decided predisposition. The left side of the face was more frequently diseased than the right. Superficial ulcers were more numerous than those extending into the depth, and the partially ulcerated forms more frequent than nodules, covered by the intact skin. The deeper forms showed a predilection for the inner angle but the author leaves it undecided whether the lacrimal sac was primarily or secondarily diseased. Their growth is very slow, so that twenty or twenty-five years may elapse before operative treatment becomes compulsory. Secondary invasions of the lymphatic glands and metastases to interior organs generally do not follow. A glandular affection is in most cases due to deep carcinoma of the skin. The prominent forms are relatively less dangerous than the nonulcerated carcinoma. Continuous irritation of warts on the lids seems to be of great etiological importance. M. attributes the rare occurrence of carcinoma of the skin in Japan to the minute cleanliness even of the lower classes of the population with whom daily hot baths up to 45 °C. are in great favor. M.'s investigations corroborate the statement of Trendelenburg that, as a rule, relapses do not occur after three years following extirpation.

The only successful treatment is radical extirpation, with removal of a ring of healthy tissue of 1/2 to 1 cm. width, as practiced by Prof. Vossius, and, if necessary, subsequent blepharoplasty, in which pedunculated flaps are preferable. In deeper growing carcinomata, especially at the inner angle, which have a very great tendency to relapses, exenteration of the orbit is almost always necessary. (Nothing is said of the treatment with Roentgen rays. Reviewer.)

Clinical Statistics on Uncomplicated Cataract.

GEROK, M., Ludwigsburg. (*Ibidem.*) G. gives statistics on 6855 cases of uncomplicated cataract from the eye clinics of Prof. Schleich at Tübingen, of Prof. Königshoefer and Dr. Distler at Stuttgart. The proportion of uncomplicated cataract to the total number of eye diseases was 4.2 per cent. in Tübingen alone 6.0 per cent. The majority of cataractous eyes were emmetropic or

slightly ametropic. With increasing hypermetropia their relative frequency decreases, which speaks against the theory of Schoen who saw in increased accommodation a predisposition to cataract. The morbidity of cataract rises with increasing age up to the 80th year, after which it shows a decadence from unknown reasons. Heredity could be ascertained in 4.9 per cent. senile, in 14.4 per cent. juvenile and congenital, in 16.4 per cent. congenital cataract alone. Occupation has no influence. Febrile diseases with subsequent debility and affection of the heart and circulation seem to predispose to the formation of cataract and to accelerate the progress of incipient opacities of the lens. G. advocates uniform records of anamnesis with regard to etiology.

ABSTRACTS FROM AMERICAN AND ENGLISH
OPHTHALMIC LITERATURE.

BY

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(Quarter ending June 30, 1903.)

The Ocular Complications of Variola.

CHANCE, BURTON K., Philadelphia, (*Amer. Med.*, April 18, 1903.) "In the analysis of over 2,000 cases at the Municipal Hospital of Philadelphia, there were 36 instances of corneal ulcer, 17 of which were followed by perforation with destruction of one eyeball, and 15 were cured without perforation. Of these cases 15 were in unvaccinated individuals, in 6 others vaccinated at periods more or less remote the lesions were less severe. Pustulation of the lid borders was a common affection; conjunctivitis was frequently found with it and was also found independently; especially to be noted were 10 cases of iritis.

The report of the ocular lesions occurring in variola is necessarily incomplete scientifically, because of the difficulty in studying satisfactorily the eyes of infected persons and the impossibility of keeping track of the individuals after their discharge from the hospital. This incomplete-

ness is increased by the fact that in several cases in which continued observation has found intraocular lesions, it is almost impossible to determine whether the conditions noted are due to the specific variolous infection, or whether they were present prior to the onset of the exanthem.

The skin of the lids is commonly a site of the pustular eruption. So much swelling of the tissues may accompany the eruption that the eyes cannot be opened for several days. In such cases severe conjunctivitis is usual and often leads to corneal ulceration. The edges of the lids are liable to ulceration and the subsequent cicatrization distorts them, so that styas, misplaced cilia, eversion of the lids, adhesion of the lids, or occlusion of the meibomian ducts, etc., may result in abscesses which produce various deformities requiring operation later." In the lacrimal passages, pustules may also form and give rise to acute and later chronic inflammation of the canal and duct. On the orbital borders periostitis with caries occurs but rarely. The conjunctiva appears congested and occasionally presents a catarrhal inflammation which is usually of moderate severity and of brief duration, yielding in a few days to treatment.

The intensity of the ophthalmia is related directly to that of the pustular eruption in general, and more particularly to that of the eruption on the face and eyelids. On the conjunctiva, pustules form but rarely; when they do occur, these pustules much resemble in appearance and course, the phlyctenular eruption observed in strumous children. They appear sometimes at the limbus, and when there frequently cause ulceration of the cornea. On the tarsal conjunctiva pustules may be found at the inner fold and on the caruncle, but never at the fornix. Subconjunctival ecchymosis may occur and may produce intense chemosis in hemorrhagic variola.

The cornea, according to their observations, is not subject to the specific lesions of variola, and their experience in the treatment of over 7,000 patients leads them to accept this conclusion. "Ulceration of the cornea does occur, but is usually independent of the general process, being rather a consequence of the conjunctival affection."

"It was our experience to find the ulceration of the

cornea less extensive in size and degree in the case of those who had been vaccinated; consequently the healing was more prompt and the sequels were less damaging to the integrity of the eyeball.

Parenchymatous keratitis after variola has been reported by but few observers. We observed two cases.

The uveal tract is not so frequently affected as the cornea. In our examinations we noted ten cases of iritis, not plastic in form, but of the serous type; this condition was especially marked in hemorrhagic variola."

Chorioiditis was revealed only by the presence of opacities in the anterior or posterior part of the vitreous.

In none of the cases examined did we find circumscribed chorioidal inflammation, nor did we see posterior polar cataract. We can report no cases of glaucoma due to variola, nor any cases of retinitis or neuroretinitis. But all these have been reported in the literature of variola by other observers.

While renal disease in the course of the variolous attacks was commonly observed, yet it did not progress far enough so that we were able to record any real cases of albuminuric retinitis. Patients with pronounced uremia sank into a coma so rapidly that it was impossible to ascertain whether or not the uremic condition had affected the retinal sheet, although it probably had. In hemorrhagic variola there is no reason to doubt the occurrence of hemorrhages into the retinal sheet and very probably hemorrhages into the optic nerve may occur. We have not been able to find any such cases reported as actually observed, but Knies is of the opinion that such hemorrhages must have been the cause of some of the affections described as neuritis with and without stasis, and with and without termination in atrophy of the optic nerve.

Meningitis as an undoubted sequel is rarely found, but we have come in contact with cases of meningitis for which no logical cause could be found except a far distant attack of variola."

A Simple Test for Stereoscopic Vision.

VERHOEF, FREDERICK HERMAN, Vienna. (*Ophth Record*. May, 1903.) "By employing a diagram consisting of two

small plain circles, one circle having two parallel lines running through its center horizontally on the left of card, the opposite circle having a single line, through its center, this line being bent at the center of the circle with its vertex pointing toward and to the left of patients.

If stereoscopic vision is present the combined figures will consist of one circle through which two parallel lines run, each of which is bent at the center of the circle, so as to form an angle whose vertex points toward and to the left of the patient."

In the absence of stereoscopic vision, the seeing eye would be easy of detection by its selection of one or the other figures.

One particular superiority claimed by V. over the tests by haploscopic figures, is the true psychical fusion gained. The writer describes more in detail the theory of fusion of parallel lines with a single bent line relative to stereoscopic vision in a previous article.—(*Annals of Ophth.*, April, 1902.)

Directions for using: "Before making the test, the left eye should be screened and the right hand figure viewed through the stereoscope, so as to make sure that an appearance somewhat similar to that of the combined figure is not produced by monocular diplopia. If there is any possibility of the latter leading to error, a modification of the test may be used. For this purpose the bent single line is replaced by a light gray one, and a single red line is substituted for two parallel lines. It is best for the red and gray lines to have the same widths. On uniting the two figures in a stereoscope, the combined figures consists of a circle and a red line, which is *bent in the middle*." The following precautions are to be considered with the use of Brewster Stereoscope: A too strong light should be avoided on account of discoloration of lines due to chromatic aberration. Vertical displacement of figures should be avoided. The card upon which these figures are drawn must be approximately perpendicular to the visual plane. Errors of refraction must be corrected first of all.

Congenital Absence of Both Inferior Rectus Muscles.

STIEREN, EDWARD, Pittsburg. (*Amer. Med.*, April 11, 1903.) A healthy, well-developed child of 6 showed the following abnormality:

"External inspection and palpation of the eyes reveal nothing abnormal. Globes are moderately prominent, lids have long curling lashes, irides are hazel brown, sclera, conjunctiva, and cornea are clear and glistening. Movements of both eyes inward, outward and upward are perfect. *When asked to look down, however, the patient fixes his head upon his chest, his eyes not making the slightest movement below the horizontal plane.*

The flexion of the head is not accomplished in one movement, but in several jerky nods, until the line of vision is sufficiently depressed to include the object sought, when the last nod centers his vision upon the object. Repeated commands to look at and name different objects (patient being illiterate) ranging in size from a silver dime to a felt hat, placed upon the floor from 4 to 8 feet in front of him, result in the same succession of downward nods, the article in every instance being correctly named. Ophthalmoscopic examination was negative, with about 0.50 D. hypermetropia in each eye. Pupils react normally to light and accommodation.

A local anesthetic (a solution of equal parts of adrenalin chlorid 1-1000, and holocain HCl. 1-500) was instilled into each eye several times and the conjunctiva grasped with fixation forceps at the lower corneal margin. Each eye could be drawn downward freely, but the upper lids, with the patient making efforts to look down, did not follow the downward movement of the eyeballs. The lower ocular conjunctiva was freely incised and retracted in a bloodless field, revealing a total absence of the inferior rectus in the right eye, nor could a small strabismus hook introduced find the slightest rudiments of an inferior muscle. A similar search in the left eye was refused by the child's father, but the condition must be without doubt the same; at any rate, there is no reason to suppose the existence of a paralyzed muscle in the left eye.

In presenting this case attention is invited to the rare occurrence of congenital absence of the extrinsic muscles of the eyeball. In the literature at my command I am unable to find a record of a similar case. A few of the textbooks make mention of congenital absence, but the absence of the same muscle in both eyes must always be a most remarkable anomaly. Yet, while its binocular oc-

currence is rare, it is more kind than monocular absence, since with the latter there would be troublesome diplopia with all its concomitants."

Changes in Refraction.

RISLEY, S. D., Philadelphia. (*Ophth. Record*, March, 1903.) In the writer's early experience he had come to believe that the static refraction of an eye was a "fixed or practically immutable quantity" except in the presence of pathological conditions; and that when the patient returned and a difference was found in the refraction that it was due to an error in the first determination; or when changed by a colleague it was due to careless or inaccurate work; and while believing in the vast majority of instances there are no changes in the static refraction of healthy eyes, admits there are numerous exceptions to this rule.

Several cases are reported in which the amount of astigmatic correction was increased, the angle changed, and one case in which a quite marked degree of hyperopic astigmatism later developed into simple hyperopia. The cases reported rigidly exclude from consideration any which involve a stretching or distension of the ocular tunics.

The Surgical Treatment of Exophthalmic Goiter.

(Editorial from *Jour. Amer. Med. Assoc.*, May 23, 1903.) "Physicians are quite ready to concede that, up to the present time, the therapeutic treatment of exophthalmic goiter has been on the whole, eminently unsatisfactory. Grunbaum, during the last year or two, has used the serum of thyroidectomized goats in the treatment of this disease. We shall have to await the results of more extended experience with the serum treatment before passing judgment upon it. Considering our demonstrated helplessness in securing any permanent improvement by the medical treatment of Basedow's disease in any large percentage of cases, the physician will welcome the inroad of the surgeon and the results he has obtained in this distressing disease. We are indebted to Professor Kocher of Bern for having conclusively demonstrated that surgical pro-

cedures give by far the best results ever obtained in the treatment of this affection.

Albert Kocher has recently reported the cases of Basedow's disease, which have come under the observation of his father, Professor Kocher, in his hospital and private practice between the years 1883 and 1899. The series comprise 93 cases, of which 74 were cases of true exophthalmic goiter. What is of especial interest in this monograph is the record of Professor Kocher's results in the operative treatment of this disease. Kocher insists that the operation should not be done when the patient is in the stage of marked cardiac and psychical irritability. Means must be used to reduce these as much as possible first. All the operations were performed under the local use of a 1 per cent. solution of cocain. Altogether, 59 of the 75 cases of true Basedow's disease were operated on.

Four of the 59 cases died with symptoms of tetany within ten days of the operation. Of the remaining 55 cases, 39, or about three fourths, had unpleasant post-operative symptoms. These consisted of transitory psychical disturbances, irritability, oppression, palpitation, sensation of heat, congestion of the face, general tremor, sweating, vomiting, fever and irregular, frequent pulse; in fact, temporary increase in the symptoms present before the operation. The fever and tachycardia persisted in all the 39 cases. The other symptoms mentioned occurred in the majority of the patients. The possibility that these symptoms were due to an acute toxemia resulting from absorption of certain substances pressed from the gland during the operation is discussed, but a satisfactory explanation for the aggravation of the symptoms is not arrived at. The other 16 patients operated on had no disagreeable after-effects. The results of the operative treatment are satisfactory. Of the 59 cases operated on, 45, or 76 per cent., were cured; 8, or 14 per cent., were decidedly improved; 2, or 3.5 per cent., were only slightly improved; 4, or 6.7 per cent., died with symptoms of tetany after the operation.

In 15 of the 74 true Basedow cases medicinal treatment of various kinds was used. The results, notwithstanding the fact that several of them were mild cases, are in strik-

ing contrast to those obtained from operative procedures. In only one case could a cure be said to have occurred, and this was really brought about by the patient developing an intercurrent disease.

Postmortems were obtained in three of four fatal operative cases. Several factors may have played a part in causing the fatal termination in the first case. There was a persistent thymus; the heart was dilated and there was a fluid exudate in the serous cavities, and the superior cervical ganglion was very much enlarged. In the second case death was found to be due to double-sided pneumonia and pleurisy. The fatal result in the third case was believed to be due to the extreme severity of the intoxication. At autopsy the dilated heart, spleen tumor, jaundice and fatty degeneration of the liver and spleen confirms this view.

The profession should be familiar with Kocher's brilliant results. Clinicians will welcome the invasion of their territory when results such as these are obtained. A vigorous warning against this operation being undertaken by only the most experienced surgeons must be made, however. Only those who have had wide experience in thyroid surgery and in the local use of cocaine should undertake the operation."

A Modification of the Perimeter, With Electric Transillumination of the Mires.

LEWIS, EUGENE R., Dubuque. (*Ophth. Record*, March, 1903.) A cylinder, containing a one candle power incandescent light is fitted to the movable mire of a Hardy perimeter; two pencils of rays are emitted, one forward, through one of four colored ground glass discs rotating in front of the cylinder, the size of the ray being regulated by an iris diaphragm; the other ray passes directly backward illuminating a celluloid strip which replaces the brass on the arc of the perimeter and has the degrees marked on it.

The fixed mire is transilluminated by a second incandescent lamp upon a bracket at the back of the instrument, its pencil of rays passing through the tubular opening in the axis of the instrument; a hood is arranged over the

lamp so as to illuminate the chart of the field, the rest of the rays being cut off.

The instrument is used in a dark room. The uniform intensity of illumination, the possibility of greater accuracy in defining the limits of a scotoma, and the improvement over the candle field taking in cataract cases, are the main features claimed by the author, for the modification.

(The abstractor was shown a similar attachment for the perimeter by Königshöfer of Stuttgart who had had it in use several years and claimed practically the same merits for it as the writer.)

A New Method of Preventing Infection from a Conjunctiva After Operations Involving Opening the Anterior Chamber.

ELLETT, E. C., M. D., Memphis, Tenn. (*Ophth. Record*, 1903.) E. desires to make plain at the start that in the case presented infection was not from the usual source, i. e., lacrimal passages: the prevention of which, as is well known, consists in general of syringing, probing and finally closing the puncta or canaliculi by cautery or ligature,—but was from the conjunctiva. When an incurable conjunctival discharge is present, there exists in consequence, as the writer points out, an almost insurmountable barrier to operations involving opening of the anterior chamber.

Patient presented himself with immature nuclear cataracts in both eyes. Conjunctival sac contained almost constantly a small amount of muco-purulent discharge, its origin being apparently from the conjunctiva. Lacrimal passages permeable and healthy. Nose healthy. Culture of secretion gave staphylococci growth. A six months treatment with appropriate astringents, etc., for conjunctival discharges, including proper attention to lacrimal passages, was devoid of results. After acquainting the patient with the dangers of operation and gaining his consent, the operation for which E. is deservedly enthusiastic was performed. Under local anesthetic the conjunctiva was incised all around the cornea as if for enucleation, and dissected from ball by means of probe freeing it well in upward and downward directions, 1/2 inch from limbus.

Cataract rapidly extracted, combined operation being done. Cut edges of the conjunctiva were picked up drawing them together over cornea, perfect apposition was secured and united by horizontal sutures. Iodoform was dusted thickly on line of union and a light gauze dressing adjusted so that it rested on cheek and brow not touching eye. Irrigation every hour with boric solution, the iodoform dusting after each irrigation. Considerable pain resulted from 8 to 10 hours, necessitating opiate; no unusual reaction. On removing the stitches the fourth day, the conjunctiva separated exposing about $1/4$ of cornea; corneal wound had closed and atropine was instilled. About three days after the removal of the stitches, cornea all exposed and the conjunctiva attached in its normal position. Conjunctival discharge persisted.

The writer disclaims any originality for himself in this procedure, citing the fact the same *modus operandi* has been proposed in France for covering of large corneal wounds the result of injuries. Ellett also emphasizes the relations distinctive of lacrimal and conjunctival discharges and that the foregoing operation should not apply to discharge from lacrimal sources.

Conditions and Diseases of the Eye which Make an Enucleation Necessary.

ERWIN A. J., M. D., Mansfield, Ohio. (*Ophth Record*, May, 1903.) After enumerating a number of diseases—iridochorioiditis, panophthalmitis, microphthalmus, intra ocular tumors, some orbital tumors, traumatic irido-cyclitis, extensive traumas, phthisis bulbi, and some forms of glaucoma—which almost invariably require some form of enucleation, the writer adds very tersely, that the condition present, and not the disease, *per se*, is the proper indication relative to operative procedure. The following rules on account of their conciseness, though being familiar to all intelligent operators, are given entire:

1. "A blind eye, which menaces a sound eye, should be removed without delay.
2. A nearly blind eye which has set up sympathetic disease of the other eye should *not* be removed. Attention is called to the fine distinction in rule 2.
3. Remove every lacerated eye with a ragged wound

in the ciliary region, before it has time to establish sympathetic disease of the sound eye.

4. Remove every eye which contains a growing tumor, before it involves the orbital tissue.

5. Eviscerate early in panophthalmitis."

Following a brief summary of the above rules entailing in No. 1 the necessity of only removing a blind eye in case it threatens a sound one or is liable to cause dangerous constitutional symptoms. No. 2—barring disease of malignant nature, it being good practice not to remove a diseased eye with some sight, even though a sympathetic affection is patent in the other eye. The apparent sight in first eye may be saved, whereas the sight of the other eye is almost invariably lost. No. 3—A clean ciliary laceration followed by prompt healing without contraction is ordinarily safe, provided no irritation be present. A ragged laceration, the eye being removed at once for fear of sympathetic affection, and that Nos. 4 and 5 call for no particular comment, the writer explains at some length the forms of operation indicated under certain conditions. E. having witnessed in the Royal London Ophthalmic Clinics several operations of Mules' and Lang's and the technique concludes; where adhesions of sclera and capsule are present, a "Mules," An irritable sclera minus adhesion, a "Lang." Simple enucleation is preferred when a likelihood of sympathetic disease is apparent; slight reaction and earlier recovery being the rule. Simple evisceration in panophthalmitis, least danger to life of patient, easy of performance. Enucleate in all cases of intraocular tumors, on account of scleral involvement.

Particular attention is directed to the superficial suture in Mule's operation, best result obtained by removing the suture—never later than forty-eight hours. Silk is the material used.

The technique of both the Mules' and Lang operation is given in detail.

Amblyopia With Slow Recovery of Vision After Extraction of Cataract.

MOULTON, H., Ft. Smith, Ark. (*Ophthalm. Record*, April, 1903.) M. describes in detail two very interesting cases in which the gratifying results obtained show con-

clusively that in selected cases, previously seeing eyes which have not been used for many years become amblyopic; and that such eyes can regain good vision, subsequently by routine treatment. The cited cases are not identical with the amblyopia of strabismus, as the writer mentions, yet the fact is made plain that there is no limit to the age at which an amblyopic eye of what ever origin can be made a useful member by giving it a chance to functionate.

Case 1. Woman, age 44, blind since 17, cause unknown, good vision in childhood. Condition in both eyes practically the same; shrunken cataracts, mobile pupils, light perception good, projection fair. Vision equals movements of hands close to eyes. Simple extraction performed, 24 hours apart; healing prompt, no reaction. Ophthalmoscope shows a healthy fundus. Vision no better than before operation: By the tenth day vision = fingers at 4 ft. with difficulty, but rapidly improving. With + 3.50 D, a perfect view of fundus was obtained and the findings being normal, no reason could be assigned for so slow recovery of image interpretation other than the absence of sight education; the same as one born blind with a resultant necessity of learning to see. In the course of three months, wearing O² + 3.50 D, patient goes about alone, threads her needle, perfectly independent.

Case 2. Woman, age 57, blind in O. D. from traumatism since 12 years of age. O.S., lost recently from ulceration of cornea. Perception and projection good. Operation was advised for O.D. when O.S. became quiet.

Operation for cataract with iridectomy was performed. About 4 mm. of central area of pupil perfectly clear. Ophthalmoscopic examination revealed clear media, normal fundus. Vision equalled fingers with difficulty at 2 feet. About three weeks after operation with + 9.00 D., vision = 10/200 yet had to be led about. Since then gradual improvement, at present goes about alone and is able to recognize friends.

Amblyopia From Non-Use.

BUCHANAN, LESLIE, Glasgow. (*Glasgow Medical Journal*, February, 1903.) The writer gives an interesting review of the condition apparently first noticed in association

with squinting early in the nineteenth century, and spoken of as congenital amblyopia, amblyopia from squint, etc. Donders, von Graefe, and Javal reported the theory that as the eye squinted the image on its retina was suppressed by a central process to avoid diplopia. Improvement of the vision after strabismus operation was cited as supporting evidence. Schweigger and others having shown that in some cases amblyopia preceded the squint, and Nuel considering that in many cases minute change could be detected in the retina, a congenital origin was accepted. Naumoff, Königstein and Hippel have described changes of traumatic origin, such as hemorrhages in the retina and chorioid of new-born children, and these facts have counted against the squint origin theory.

Opposed to this we have numerous observations of improvement of vision in an amblyopic eye by forced use, after the loss or damage of the other. It is not necessary for the ametropic eye to become amblyopic, although this is usually so, and the amount of refractive error is often disappointingly low; but no case has been recorded in which there was emmetropia. Squint is not essential though general. The peripheral field of vision is almost invariably normal, but in many cases there is a minute central defect. In cases of high emmetropia even the best correction may fail to raise vision to the normal. Such cases must not be confounded with those under discussion. There is a frequent chronic congestion of the optic nerves with lines of exudation along the retinal vessels; vision may improve when rest is given to the eyes; the defect is rather due to over- than non-use of the eyes.

Finally, true amblyopia from non-use is never bilateral. The young infant has only very defective vision; at birth probably only qualitative perception of light. Binocular vision is established, generally at the second year. This is not a congenital attribute, although the tendency to it probably is, but is the result of education. If this education is rendered peculiarly difficult by the existence of a refractive error, the effort to cultivate this power may be given up at a very early date, resulting in a loss of binocular vision, as in cases of anisometropia, or the image from one eye is suppressed by a mental process which is probably quite independent of the will. If a strong con-

vex lens be held before the right eye and a small object regarded carefully through it, it will be found that the other eye, although wide open, sees almost nothing; similarly, if one looks through a telescope at a distant object, using the right eye, the left eye, unless attention be specially given it by closing the other for a moment, is not being utilized at all. In fact, some practice is required to enable an observer to see an enlarged image of a distant object through a telescope, and the other object with the other eye. The use of the lens or telescope brings about what is tantamount to an error of refraction, and binocular vision is interfered with. If under these circumstances the adult brain shows a tendency to suppress one retinal image, the same fact will hold good with greater probability in the case of a child, to whom binocular vision has not been rendered habitual and automatic by constant use.

It has been stated (Berlin, Leber, Steffan) that no improvement can be hoped for in cases of amblyopia from non-use. Buchanan does not agree with this dictum, having treated a number of cases by forced use of the defective eye. "As the results of these experiments it may safely be said that in no case has the result been disappointing. If the patient will follow out directions faithfully and patiently, a very large percentage, at all events, of those cases which Berlin considered as hopeless (sight less than $1/30$ of normal) will regain a very considerable amount of vision." Two cases of this sort are reported. In one, vision improved from $1/50$ to $1/4$ after two month's treatment. In the other there was seen four years ago a convergent squint of nearly 10° . After tenotomy, with an advancement of the externus, vision improved in the course of a month of forced use, from $1/200$ to $1/20$. After two months more with forced use for one hour each evening, $1/10$ normal, and continued to improve steadily until eighteen months after operation patient saw $2/3$ and read the smallest type without fatigue. This continues to the present time.

Angeoid Streaks of the Retina.

LISTER, W. T., London. (*Ophthal. Review*, June, 1903.)
The writer discusses the etiology of those cases in which

we find a system of colored irregular branching lines, radiating from the region of the optic disc. The histories are of no special interest, having little in common. The disease is binocular and occurs in middle life. Vision varies considerable, being normal, with complete fields, even though the streaks are well developed, in some cases, while in others it is poor and deteriorating. As seen by the ophthalmoscope the streaks lie behind, that is, external to the retinal vessels. There is generally a more or less circular band round the disc from which the other streaks which branch and may anastomose, radiate toward the periphery, but apparently never reach it. The streaks vary in width from half to four times the diameter of the retinal veins at the disc, have sharply defined outlines, a curved or angular course which corresponds with neither that of the retinal nor of the chorioidal vessels, and are variously described as red, brown, grey or lead color. In one case (deSchweinitz) a red streak became brown and pigmented. The surrounding retina was normal in a few cases with good vision, while in others a whitish opacity round the disc and light grey or white bands bordering the streaks on one or both sides were found. In some instances these borders developed late in the disease. Retinal hemorrhages are not infrequent, and at the site of the effusion fresh streaks appear when the blood is becoming absorbed. In a number of cases neither hemorrhage nor any of the usual indications of past or present extravasation were discovered. Macular and peripheral changes due to chorio-retinitis have been noted.

The observations of Nieden, Holden, and deSchweinitz have given rise to the view that the streaks are formed as a result of hemorrhages, and the pigment derived from blood-corpuscles. This does not explain the arrangement in streaks. The streaks lie behind the retinal vessels, with which the lymph channels pass (Schwalbe) and before the layer of rods and cones, as they have been seen ectopically (Walser). Hence the pigment should be deposited in the course of the retinal vessels, which is not the case. Again, if of hemorrhagic origin, the streaks would have to be very widely distributed, and some sign of either past or present hemorrhage would be found in every case.

The theory of congenital origin (Fretori) and that of causation by some chronic form of retinitis also fail to explain the form of the streaks. No microscopic examinations have been recorded.

The author has made sections of the retina in two cases which give evidence that streaks may be associated with systems of newly formed blood vessels in the retina. In both specimens there was no obvious communication with either the retinal or chorioidal vessels, but in one, a vessel was traced from the ciliary body to the detached portion of retina lying on it, so that "the two possible sources of the new vascular system are the vessels of the ciliary body and those of the optic nerve." Partial detachment of the retina, with granulo-cellular pigmented deposits both on the external surface and in the substance of the detached portion, was noted, corresponding with the most marked streak. "In the external layers of the degenerated retina, in some places corresponding with the pigmented streaks, well marked obliterated blood vessels of new formation are seen." In one case there is besides "a well marked infiltration of the retina which surrounds the new vessels, and also occurs as a rounded mass in cross section lying near the vessels and appearing to take part in the formation of the streak."

The author thinks it possible that newly-formed blood vessels may penetrate into chronically inflamed tissue in the retina "in the same way that vessels make their way from the optic disc into exudate or hemorrhage into the vitreous."

Pigmentation and calcareous changes in the vessel walls account, respectively for the color of the streaks and the glistening patches seen in their course, presence or absence of exudate around the vessels or of degeneration in the neighboring retina, for the presence or absence of white bordering bands.

Cases with good vision may be congenital and due to changes which occurred "in utero, at the time when the retina has not become flattened out, and the internal layers might escape permanent injury."

Tuberculosis of the Conjunctiva Cured by X-rays.

STEPHENSON, SYDNEY. (*Brit. Med. Jour.*, June 6, 1903.)

The writer reports the case of a 4-year-old child whose left eye had "mattered" for two months, looked heavy and red, while the glands below the left lower jaw were swollen. The lids were semi-closed and obviously thickened, like the side of the face, from lymphangitis. Trachoma-like material appeared in the semi-lunar fold; the lower palpebral conjunctiva was bestrewn with granulations and folds of coxcomb-like tissue, but without ulcerations; the tarsal conjunctiva of upper lid was scarcely involved. Cornea clear. Microscopic sections of some of the more prominent granulations showed a typical picture of tuberculosis, the giant-celled systems being especially well marked. A restricted number of tubercle bacilli were found, but only after many specimens had been examined. Inoculation experiments with rabbits' eyes were positive.

"The lids were exposed to the x-rays, 6 to 10 in. from the focus tube, for about ten minutes. After one month—nine sittings—the local condition underwent a great improvement." Three months later, after four more exposures at 6 in. distance, "the conjunctiva appeared to be wholly free from disease, and the only cicatrices present were those produced by the removal, for diagnostic purposes, of diseased material."

Tuberculosis of the conjunctiva is one of the rare diseases. It is a chronic process, generally affecting persons under twenty, and often appears to be primary. This may be explained by the exposed position of the conjunctiva and the frequency of tubercle bacilli in the air from dried sputum. Foreign bodies, phlyctenulae, or direct operative inoculation may be the factors of infection; in the last instance general disseminated tuberculosis has been found. The specific organisms can usually be found in scrapings from miliary ulcerations, but are difficult to find in the prominent granulations of some forms of the disease, and never or rarely, appear in the discharge from the eye.

Experimental inoculation of rabbits or guinea-pigs is now demanded in confirmation of the diagnosis. Treatment of scraping, excision or burning, combined with the liberal use of iodoform, the methods followed until now, may be of use when the affection has not advanced far. They are all followed by scarring and even by deformities

of the eyelids. X-ray treatment is simple, painless, and free from danger, while absolutely no scarring or trace of disease is left.

Retinal Hemorrhages as a Diagnostic Feature in Fracture of the Base of the Skull and in Subarachnoid Hemorrhage.

FLEMING, R. A., Edinburgh (*Edinburgh Med. Jour.*, April, 1903), refers briefly to the anatomy of the optic nerve, its sheaths, and the subarachnoid space. The last is of considerable capacity, as the membrane does not dip into the fissures of the brain; in addition it contains several large cisterns or sinuses with one of which this paper is specially interested. The sinus subarachnoidalis basalis is formed by the arachnoid stretching over the corpora albicantia and being attached to the optic chiasm. Laterally, the membrane is closely applied to the crura cerebri, and the space so roofed in by the arachnoid is of considerable size. There is no median raphé, but the stalk of the pituitary body must help to divide the space into two halves, at least anteriorly.

He found in examining the eyes of persons who had died of fracture of the base of the skull, directly or by contra coup, there had been a great amount of subarachnoid hemorrhage, that retinal hemorrhages were common—in fact, almost the rule. When the subarachnoid hemorrhage was unilateral, the retinal hemorrhages were generally, but not invariably, limited to the same side. They were usually massive, or of irregular outline, and were situated at some distance from the optic disc.

The diagnosis of basal fracture is not always easy. When the anterior fossa is involved there is often bleeding or escape of cerebro-spinal fluid from the nose, or discoloration about one or both eyes, from extravasation through the sphenoid fissure; where the fracture extends to petrous portion of the temporal bone, blood or cerebro-spinal fluid may escape from the ear. When the posterior fossa is the site of the fracture, the diagnostic signs are very uncertain; discoloration behind the mastoid, and sometimes a more diffuse discoloration on the neck may be noted. The recognition of retinal hemorrhage is easy, and its importance shown by the report of twelve cases, all of which showed fracture of the base excepting one,

in which there was a fracture of the squamous part of the temporal bone.

Group I. Contains five cases of fracture, in which the subarachnoid hemorrhage was mostly unilateral, and retinal hemorrhages were confined to the eye on the same side. All were basal fractures but one, that of the squamous portion of one temporal bone. The fracture was on the left side and the subarachnoid effusion on the right.

Group II. Contains two cases of fracture of the base in which the hemorrhage was almost equally marked on both sides, with retinal hemorrhages in both eyes.

Group III. Five cases of basal fracture, in which there was no retinal hemorrhage visible to the eye after death. In these cases with two exceptions, there was little subarachnoid effusion, or an effusion of apparently slow out-set; and in one of these, pressure seems to have interfered with the passage of blood into the inter-sheath spaces of the optic nerve.

To exclude any fallacy as to the retinal hemorrhages being the result of the concussion, or the asphyxia or other abnormal condition which might be associated with fracture of the skull, the writer examined a number of cases of subarachnoid hemorrhage not secondary to fracture of the base. In this group there were four cases, three of hemorrhage into the region of the basal ganglia, one of pontine hemorrhage. In three of these cases there were retinal hemorrhages. In the case of pontine hemorrhage they were present in both eyes; in the other two cases confined to the side of the chief subarachnoid effusion. One case was an ordinary cerebral hemorrhage. Only a very small amount of blood was found in the subarachnoid space, and it was in reality mostly blood-stained lymph. In this case there were no retinal hemorrhage.

The conclusion suggested by these cases is that a subarachnoid hemorrhage, if sufficiently rapid in its development, will cause retinal hemorrhages, and if unilateral will generally involve only the retina of the affected side. The exceptional cases show that blood may be prevented from entering the intersheathed spaces and causing rise of pressure and hemorrhages in the retina. In one the absence of blood was "amply explained by the extraordinary amount of bruising in the region of the chiasm,"

in an other, possibly, "by the slow rate of bleeding into the subarachnoid space." It is not easy to explain the cases in which, although the sinus basalis was full of blood, retinal hemorrhages were mostly confined to one side, as there is no median raphé and the stalk of the pituitary body is the only division of the space. Hydrostatic principles may offer an explanation. There is very generally a good deal of flattening of the convolutions of the cerebral hemisphere on the opposite side from the subarachnoid hemorrhage.

Blepharitis Marginalis.

REYNOLDS, DUDLEY S., Louisville, Ky. (*N. Y. Med. Jour.*, June 6, 1903.) The writer divides blepharitis into three classes of cases: Concerning class A, he says:

"One of the commonest forms of blepharitis marginalis, seen in persons of every rank and station in life and of all ages, is that in which there is slight thickening of the borders of the lids. The anterior margins are dry and red, and the lash, on close inspection, is observed to be thin, while the cuticle between the hair is covered with minute scales of desquamating epidermis. This condition seems aggravated by constipated bowels, by the loss of sleep, and by fatigue of any kind. Cases of this kind are frequently observed to disappear almost entirely under correction of errors of refraction, of intestinal constipation, and of any form of malnutrition or debility; while, on the recurrence of any of these abnormal conditions or the use of the ametropic eyes without glasses, the local affection in the margin of the lids reappears. This is a condition that seems to be least susceptible to the action of any of the mercurial ointments. In fact, the fungus present in the hair follicles seems incapable of producing much thickening and excoriation until some hyperemia is set up; then the blepharitis takes on active symptoms. In cases seemingly cured by correcting errors of refraction, etc., close inspection will disclose a small, sheath-like elevation of epidermis around each hair in the lash.

I believe the fungus in the follicles in such cases may be entirely eradicated, and permanent recovery secured for many of them, by the periodical application of pure carbolic acid. I apply it with a needle, first preparing the

acid by adding about ten minims of alcohol to the drachm of crystalized acid, and agitating sufficiently to dissolve all crystals. This will usually remain in liquid form as long as it is kept in a well stopped vessel. Into this fluid, I dip the point of the needle, and, holding the lid firmly with the fingers of the other hand, I scrape off all the detachable scales between the lashes, making the application as nearly direct and complete as possible to all the hair follicles of the margin of the lid. By repeatedly dipping the needle into the acid and scraping the skin, taking care that none shall be allowed to run over the free border, the application can be made so thorough and complete as to whiten all that portion of the skin containing the lash. This creates a little temporary smarting, which is not severe, and which lasts not more than two or three minutes. About the fifth day after each of these treatments a crust of epidermis exfoliates and should be removed, and a little yellow oxide of mercury ointment applied. The application of the carbolic acid should be repeated about once in ten days, in ordinary cases. In the course of about three months, it will be observed in most cases, especially in young persons, that a heavy and luxurious growth of lash has come on, and with it entire disappearance of all the manifestations of blepharitis. I have observed that most of these patients seem permanently cured, after a lapse of five or ten years.

Class B. The cases which present an excoriated, glazed, red, rounded appearance of the tarsal margin, with no sign of lash, are seldom seen with both eyes affected to the same degree. It often happens that one eye may be placed in Class A, while the other presents an aggravated condition, with a tendency to fissure at the external canthus. Constitutional disturbances and errors of refraction are alike provocative of aggravated symptoms in these cases. I have never observed much relief from local treatment with ointments; and, for that matter, nothing approximating curative results from any sort of treatment, excepting the phenol, applied as described in Class A. I have frequently observed, where the lid is very greatly thickened, the margin rounded off, and of a bright red, glazed appearance, absolutely free from any sign of lash, that after two or three applications of the phenol, at in-

tervals of ten days, great reduction in the thickening of the lid is secured, and a fair growth of lash begins to appear; and, by the continued prosecution of this plan of treatment, with constitutional correctives, absolutely complete recovery occurs in many persons under forty years of age. It is especially efficacious in children, who are always averse to systematic rules for applying ointments.

Class C. Another class of cases is that in which an abundant accumulation of inspissated sebum mats the lashes together in groups. When the crust is removed, it is usual for most of the hairs of the lash to come away with it, disclosing an ulcerated condition of the lid, which destroys the hair follicles. This condition is sometimes associated with great thickening of the margin of the lid, and dilated veins are often seen coursing over the surface of the lid, just under the skin. On everting the lid, a relaxed and flabby condition of the retrotarsal conjunctiva appears. There is profuse lachrimation, and sometimes photophobia. The crust is best removed, after an application of simple petrolatum, with a cotton mop, made by rolling a bit of cotton on the end of a probe, and dipping it into ointment, and smearing the lids in contact with the upper boundary of the lash. After a little rubbing with this mop, the crust becomes loosened at the upper edge and may be lifted off with the dressing forceps, or turned out with the end of a small probe. The ulcer, which is sometimes deep and of conical form, should now be cleansed by pressing into it a clean cotton mop; and, after removing all the moisture, a small portion of phenol should be applied to the bottom of the ulcer. Keeping the lid separated, to prevent any flow of tears carrying the phenol between the lids, it will soon be observed that the whitening produced by the phenol has disappeared by becoming incorporated with the tissues. The patient may now have a piece of gauze, smeared with petrolatum, laid over the closed lids, and a bit of cotton wool on the outside of the gauze, secured with a few strips of plaster, laid from the cheek to the forehead. This dressing should not be disturbed for twenty-four hours, when the treatment may be repeated, if necessary, as at first, excepting that it will be observed no crust has reappeared in the lash, and

therefore, no preliminary treatment is required. The ulcer, however, should be carefully dried and again treated to an application of the phenol. In some cases a single treatment will be found sufficient to cure the ulceration. By this plan of treatment, some of the worst cases may be entirely cured within ten days. Always bear in mind, however, the necessity for close attention to constitutional correctives."

On Peritomy for Diffuse Corneitis and Other Affections of the Cornea.

SNELL, SIMEON, Sheffield, England. (*The Lancet*, May 30, 1903.) The writer gives the history of the introduction and employment of this operative method of treatment, pointing out that it has been used chiefly for pannus complicating trachoma, and then describes his own experiences and the class of cases in which he has found peritomy of service.

"With regard to the operation a general anesthetic may be given, and indeed it is sometimes required, but in the majority of my instances I have used cocain. The operation is a brief one and if the cocain is freely instilled it is usually sufficient. In addition, however, I use adrenalin, instilling it two or three times before commencing the operation. This affords the very great advantage of allowing the operation usually to be a bloodless one, or nearly so, and also the adrenalin seems to increase the anesthetic effect of the cocain. A speculum is then inserted and the patient desired to look downward; a fold of the conjunctiva just beyond the cornea at the upper part is seized with forceps and then snipped with curved scissors. From this point the conjunctiva is severed all round the cornea at a distance of from two to three millimetres. The portion left adhering to the cornea is next dissected up and removed with scissors. The division of the conjunctiva around the cornea is facilitated by using a pair of scissors having one blade somewhat longer than the other and ending in a bulbed extremity which readily runs underneath the conjunctiva. Recovery is usually quick from the operation, especially in young subjects. For a few days a rim of bare sclerotic is visible, but after the lapse of a very short time there is little indication of any operation having been

performed. In a few cases I have performed a partial peritomy opposite any particular portion of the cornea which it was specially desired to affect. This will be further mentioned when I refer to the cases. I have performed peritomy in about 100 cases of diffuse corneitis and my experience has taught me that it is a remedy of particular value. Employed at the earliest stages it, in some instances, seems almost to abort the disease, whilst in others it undoubtedly very materially shortens the long period that such cases usually last. The beneficial effects are often quickly seen in those instances of corneitis which soon show the characteristic salmon-tinted vascularity, particularly at one border of the cornea. For a case in which the salmon-tint vascularity was situated at the upper part of the cornea I did a partial peritomy above. The effect was undoubtedly good, but when the other eye commenced in a similar position I performed a complete peritomy with, I believe, greater advantage. I have seen no evil results from the operation, and therefore I should always advocate the complete and not a partial operation. When both eyes are affected I frequently operate on both at the same time.

The results of peritomy in cases of double keratitis have been very satisfactory even when the disease has already been going on for several weeks. I am disposed to think, also, that the cornea recovers its transparency more completely in those cases which have been peritomized than in those in which other methods have been adopted, and thus there is less likelihood of corneal opacities, or should they result they will be less dense than if peritomy had not been performed. For several instances of chronic ulcer of the cornea I have employed peritomy. In one case the benefit was very marked. A man for many years had chronic ulcers, small leashes of vessels running across the cornea to the ulcers. Sometimes he was better, sometimes worse, but the condition had continued for some years. In each eye peritomy was performed with distinct benefit and he was speedily better than he had been for several years. In ulcers, also, which show a tendency to recur peritomy has been done with advantage. A large ulcer on the cornea, to which a leash of vessels ran, was treated with some benefit with the ordinary methods, including the use of the

cautery, but still did not heal. A partial peritomy was done, the conjunctiva being severed and the corneal portion removed corresponding to about from one-third to one-half of the cornea opposite which the ulcer had been situated. The ulcer quickly healed.

Another variety of ulcer of the cornea for which I have performed peritomy with advantage is that superficial kind which occurs in people of middle age and which may spread so much as ultimately to involve the whole of the cornea. Such a case happened last year in a lady, aged about 60 years, in whom an ulcer of this nature began at one edge of the cornea and spread until a superficial ulceration involved practically the whole of it. It was attended with very severe pain and effectually resisted the ordinary applications. Any direct treatment, such as the application of the cautery, was refused by the patient. After six weeks of continuous suffering consent was at last obtained to put her under ether and to perform peritomy. This was accordingly done, and at the same time the ulcerated surface was in some places lightly touched with the cautery. Improvement was immediate and at the end of a week she talked of returning to Scotland and ultimately did so in about ten days. Another class of case in which peritomy may be used with advantage is that which is described as detachment of corneal epithelium. In such an instance which had been continuous for three months I did a peritomy recently with marked success. In my opinion we possess in peritomy a most useful means of treating diffuse corneitis and that in many other corneal affections it is a remedy of great value. In a recent instance of relapsing iritis in a young man peritomy rendered excellent service. I have used it with benefit in other cases, too, of iritis and corneo-iritis."

Report of Five Cases of Glaucoma in which Adrenalin Caused an Increase of Tension.

MACCALLAN, A. F., London. (Report of May Meeting of Ophthal., Society of U. K. *The Lancet*, May 16, 1903.) Mr. A. F. MacCallan reported five cases of Glaucoma in which adrenalin caused an increase of tension.

The subject was of interest in connection with the extended use of this drug in ophthalmic operations. In case

1, the patient was a woman who had been treated by free instillation of eserine in both eyes. Tension in the right eye was normal; in the left it was $+1$. After the use of adrenalin and eserine together there were headaches and vomiting and tension in the left eye was $+3$. In case 2 a man suffering from acute glaucoma had a tension of $+2$ in the left eye and $+1$ in the right eye. Adrenalin and cocain were applied before operation and the tension in the right eye rose to $+2$. In case 3, a woman suffering from acute glaucoma in the right eye, after the use of eserine presented a tension of $+1$; the addition of two drops of adrenalin solution raised it to $+2$. In case 4, the patient was a man with increased tension who after the use of adrenalin presented symptoms of glaucoma, the tension being raised to $+2$. After operation the vision was $\frac{6}{9}$ in each eye. In case 5 a woman with acute glaucoma improved under eserine, the tension being $+2$. Adrenalin was applied before operation with the result that tension was raised to $+3$, and hemorrhage occurred. An increase of tension was not the invariable consequence of the use of adrenalin, but it was common in cases of acute and subacute glaucoma, and in two such, retinal hemorrhages had occurred in the experience of Mr. MacCallan. Other cases in which adrenalin had been used showed no change in tension or in the fundus, but the vascular constriction produced by adrenalin appeared to prevent the absorption of other drugs such as those employed to contract the pupil.

The Paradoxical Reaction of the Pupil in Accommodation, With a Report of Three Cases.

SPILLER, WILLIAM G., Philadelphia, Pa. (*Phil. Med. Jour.*, May 2, 1903.) The writer relates the histories of three cases of this rare condition, two instances having been previously reported by W. Vysin. This phenomenon is not the same as the better known paradoxical reaction to light, in which the pupil becomes larger when the eye is exposed to light. The two abnormal forms of pupillary reaction are not necessarily present in the same person. He quotes the following from a recent article by J. Piltz: "W. Vysin published two cases of perverse pupillary reaction. The perversity of the pupillary reaction

consisted in the very interesting observation that the pupils enlarged in accommodation while they diminished in size while looking into space. One was a case of traumatic neurosis, the other presented the phenomenon of perverse pupillary reaction temporarily and only at the time of an attack of migraine. The abnormal phenomenon of the pupils disappeared always on the cessation of an attack. According to Vysin, this second case is proof that (1) migraine is a disease caused by changes in the cerebral cortex and (2) that the reaction of accommodation is likewise under the control of the cerebral cortex. The diseased cerebral cortex does not influence the movements of the pupils in the normal manner. When in this patient the attacks of migraine ceased and the control of the cerebral cortex returned, its influence was observed in the reflex pupillary movement."

The writer adds: "I have observed three cases in which the pupil became smaller on fixing a far object, and larger on fixing a near object, and larger when the eyeball was directed downward and inward, the other eyeball being covered. I believe at present that this phenomenon is not necessarily indicative of organic disease, but, as it has rarely been observed, it is well to be cautious in its interpretation. At present no satisfactory explanation suggests itself to me. Piltz says that in most cases of paradoxical reaction of the pupils to light the dilatation is an associated movement with the divergence of the eyeball resulting from paresis of the abductor. In such cases when a near object is fixed, the pupil remains contracted until the internal rectus becomes exhausted and the eyeball deviates outward, at which time dilation of the pupil occurs as an associated movement. This cannot be the explanation of two of my cases at least, and probably not of the first, because the weakness of the internal rectus was slight in one case and absent in another. The dilatation in fixing a near point occurred immediately after fixation. The dilatation in looking downward and inward occurred when the eyeball was exposed to strong daylight, and the phenomenon was absent in other persons exposed to the same test. Piltz says that until the present time the paradoxical reaction in accommodation has been observed only in functional cases. The first of my three cases was unquestionably one of organic nervous disease."

After Results of Sixty-Three Operations for Depression of the Lens Performed by Indian "Cataract Prickers."

MAYNARD, F. P., Calcutta. (*The Ophthalmic Review*, April, 1903.) The writer has kept notes for some years in practice in India of cases of depression of the lens met with; the following summary is of interest in view of Power's plea for the occasional performance of this operation. (*British Med. Jour.*, 1901.)

"The broad *result* brought out by these cases is that twenty-nine out of sixty-three of depression, or 46 per cent., retained good vision after an average interval of nearly five years. Two influences weaken the value of these figures, though in opposite directions. Couchers sometimes depress simple chronic glaucomatous eyes, mistaking or not caring about the disease for which they operate. Only one of this series appeared to have glaucoma when couched. On the other hand, the results are probably better than these figures indicate, because only those dissatisfied with their couched eyes are likely to come for extraction of the other. Of thirty-five so coming thirteen had good vision in the couched eye, and twenty-three had p. l. or no vision (eleven p. l., eight *nil* and four shrunken globes). Himby, quoted by Power, had ninety-six per cent. successes in 1843.

The *advantages* of depression are the immediate vision, short confinement to bed, absence of any wound to gape if it heals slowly, lessened danger of sepsis, prolapsed iris or vitreous, intraocular hemorrhage, and finally the absence of astigmatism, and the normal appearance of the eye in successful cases.

The *disadvantages*, considered apart from the high percentage of lost eyes, are the vomiting and inflammation that often occurs at, or soon after, the operation, fairly common even in cases that evidently do well according to the patients' statements, the irido-cyclitis, chronic glaucoma, and sometimes gradual loss of vision without recognisable organic change, which infrequently occurs in unsuccessful cases.

Weighing these considerations carefully, one cannot help agreeing with Mr. Power in his conclusion that *under certain circumstances* it "would be at least allowable, if

not advisable, to revert to the ancient method of 'depression' for the restoration of sight in cases of cataract.

Acute Amaurosis Following Infantile Convulsions.

ASHBY HENRY, Manchester, and STEPHENSON, SIDNEY, London. (*Lancet*, May 9, 1903.) The authors describe a form of more or less temporary blindness in early life entirely distinct from that due to attacks of posterior basal meningitis, which they consider "post-eclamptic" — that is, a result of series of convulsions with coma suggesting the "status epilepticus" of adults. An analysis of five cases, together with six previously reported by Gay and by Nettleship, is given. Two were between six weeks and two months, two between seven months and eight months, four from thirteen to eighteen months, and three from two-and-a-half months to three years. The history in nearly all of the cases records that the fits were frequent and accompanied by coma or stupor which lasted some hours or days. In some instances the coma was so serious that death appeared to be imminent. In two cases the convulsions occurred during whooping-cough, and one followed "congestion of the lung;" in eight cases no cause could be signed. In one case the convulsions were only slight; in the rest the attacks were evidently severe, the "status eclampticus" lasting for some hours.

It is possible that the toxin of pneumonia or influenza may have been the cause in some of the cases, or less likely the convulsions were uremic. In one case, aged two months, the convulsions and stupor lasted for two months, the convulsions and stupor lasted for two weeks, the amaurosis which followed was still present when seen at the seventeenth month of age, and there was apparently some optic atrophy, as the "discs were of a light shade". In seven cases (63 per cent.) there was more or less paralysis; in one of these the paresis of the left arm disappeared in a week or two. In four there was a well marked right hemiplegia which lasted for some months and in some cases the paralysis seemed likely to be permanent. In one case there was a left hemiplegia and in another weakness of the legs.

The fundi were normal in all but two; one was whiter than normal, in the other the discs were of a light tan shade.

In all but one there was recovery of sight. For the most parts the pupils were normal and active, in others sluggish. In one case there was temporary aphasia. In only one was there a note of the urine; in this case there was no albuminuria.

Post mortem examinations in "status eclampticus" are disappointing, showing nothing but a wet brain with venous congestion—at least to the naked eye. Reflex irritation is probably the cause, more often than central lesions but the latter, in the form of a thrombosis or hemorrhage involving the Rolandic area or its "hinterland" must be present in cases associated with hemiplegia which becomes permanent. The stage of coma may be the result of exhaustion or of the toxin poisoning, and where consciousness returns, the visual centres are left in anesthetic state. Analogy is shown between this condition and the visual aura of epilepsy in adults, the transient hemianopia associated with migraine in neurotic subjects (amaurosis partialis fugax), and that following unilateral convulsions in adults with general paralysis.

The Germicidal Action of Alcohol.

HARRINGTON, CHARLES, Boston. and WALKER, HAROLD, Boston. (*Boston Med. and Surg. Jour.*, May 21, 1903.) On account of the frequency with which alcohol is employed to disinfect the instruments used in ocular surgery, and the hands of operators, the following abstract will be of interest to ophthalmologists. The writers determined the germicidal properties of different concentrations against some of the more common pathogenic bacteria, with different periods of direct contact. A summary of the more important investigations already published and an outline of the history of alcohol as a disinfectant are given. Various pathogenic organisms in both moist and dried conditions were exposed to alcohols of different degrees of concentration, for periods of varying duration. The bacteria were exposed on silk threads partly in a moist state and partly after being dried for 48 hours. The results of the various experiments are presented in tabular form. The conclusions arrived at are given as follows:

"(1) Against dry bacteria, absolute alcohol and ordinary commercial alcohol are wholly devoid of bactericidal

power, even with twenty-four hours' direct contact, and other preparations of alcohol containing more than 70 per cent., by volume, are weak in this regard, according to their content of alcohol, — the stronger in alcohol, the weaker in action.

“(2) Against the commoner, non-sporing pathogenic bacteria in a moist condition, any strength of alcohol above 40 per cent., by volume, is effective within five minutes, and certain preparations within one minute.

“(3) Alcohol of less than 40 per cent. strength is too slow in action or too uncertain in results against pathogenic bacteria, whether moist or dry.

“(4) The most effective dilutions of alcohol against the strongly resistant (non-sporing) bacteria, such as the pus organisms, in the dry state, are those containing from 60 to 70 per cent., by volume, which strengths are equally efficient against the same organisms in a moist condition.

“(5) Unless the bacterial envelope contains a certain amount of moisture, it is impervious to alcohol; but dried bacteria, when brought into contact with dilute alcohol containing from 30 to 60 per cent. of water by volume, will absorb the necessary amount of water therefrom very quickly, and then the alcohol itself can reach the cell protoplasm and destroy it.

“(6) The stronger preparations of alcohol possess no advantage over 60 to 70 per cent. preparations, even when the bacteria are moist; therefore, and since they are inert against dry bacteria, they should not be employed at all as a means of securing an aseptic condition of the skin.

“(7) Provided the skin bacteria in the deeper parts can be brought into contact with disinfectants, alcohol of 60 to 70 per cent. strength may be depended upon usually, but not always, to destroy them within five minutes.”

The Reaction Time of Corrosive Sublimate in Different Dilutions against Various Species of Bacteria.

HARRINGTON, CHARLES, Boston, and WALKER, HAROLD, Boston. (*Boston Med. and Surg. Jour.*, April 23, 1903.) The writers give the results of experiments in which various micro-organisms were exposed to solutions of corrosive sublimate. 1:1000, 1:5000, and 1:10,000. The following general conclusions are given:

“(1) Different species of pathogenic bacteria, and different cultures of the same species, vary very greatly in their resistance to the action of corrosive sublimate.

“(2) With some species, resistance is diminished in a remarkable degree by condition of dryness, so that even the 1:10,000 solution can bring about sterility in a very short time. But some species are not materially affected in this respect by dryness.

“(3) Corrosive sublimate in as weak solution as 1:5,000 is ineffective against the common pathogenic bacteria, including the pus organisms, when they are moist, excepting after prolonged contact. Since fifteen minutes' contact is not sufficient for the destruction of *B. coli communis*, *B. pyocyaneus* and *Staph. pyogenes albus* in the moist state, or of *Staph. pyogenes aureus* whether moist or dry, the use of this and of weaker preparations in surgical work and for irrigation and similar purposes should be abandoned.

“(4) Corrosive sublimate in the 1:1,000 solution is very slow in its action on some of the commonest of skin bacteria and, since under the most favorable conditions more than ten minutes' contact may be necessary for it to kill *Staphylococcus pyogenes albus*, it should not be relied upon to any great extent to ensure sterility of the hands or of instruments. The mere dipping of the hands for a few seconds into solutions of this strength can serve no useful purpose, but, on the contrary, can lead to much harm by inducing a false sense of security. In order to produce sterility of the hands through the use of this preparation, absolute dryness of the bacteria present would be essential; but a condition of the skin which would ensure such dryness would also ensure the bacteria not on the very surface against contact with the poison.

“(5) Corrosive sublimate in any of the strengths commonly employed is a much overrated disinfectant and, under the best conditions, is so uncertain in its action that it would be best to abandon its use altogether in surgery.”

Fracture at the Base of the Skull.—Neurological and Medico-Legal Considerations.

BAILEY, PEARCE, New York. (*Medical News*, May 16, 1903.) In the course of an article on this subject, the

writer makes the following references to ocular symptoms:

“*Optic Nerve*.—Injury to this nerve is more frequent, probably, than clinical records indicate. Slight symptoms referable to it readily pass unnoticed in comatose patients, or in those not submitted to special examination. The nerve is almost always affected in front of the chiasm, hemianopic symptoms being rare. Optic nerve disturbances after fracture at the base are most frequently due to involvement in the fracture of the thin walls of the optic canal. Displaced portions of the bone may crush and permanently destroy parts of the nerve, causing permanent blindness in the corresponding portions of the field. It is probable, also, that amblyopia may be caused by hemorrhages of the base, which push their way into the optic canal without this latter being fractured.

“The type of contraction of the field is not the concentric, as in ordinary atrophies, but rather a loss of the upper, lower or particularly the lateral halves of the field. The visual disturbances are for the most part one-sided, corresponding to the side of the injury, which is usual to the frontal temporal or parietal regions. It is rather difficult to estimate the frequency with which substantial recovery from the initial amblyopia or blindness occurs.

“I am inclined to think that ophthalmologists, who most frequently see the cases which have gone on to atrophy and permanent blindness, regard the prognosis in every case as more serious than do surgeons, who see the patients immediately after the injury and may, therefore, witness defects in sight which are transient. Knotz (*Wiener Med. Presse*, 1900, 30, 31, 35) reports a series of ten clinical cases giving symptoms of fracture at the base and visual disturbance. In half of his cases vision was affected in both eyes, though the eye corresponding to the side of the external injury showed more serious and more permanent symptoms. Of these ten cases, in eight there was amblyopia on the side of the injury, but in only one was the amblyopia permanent. On the side opposite to the injury amblyopia occurred five times, but was always transitory. In one case there was immediate and permanent blindness on one side. In another there was immediate blindness in both eyes, but vision was perfectly restored in the eye opposite the injury, and on the same side there

was left a contraction of the visual field. Of Van Nes' three cases of unilateral opticus injury, immediate one-sided blindness resulted in all. In one, death resulted; in another, complete restoration in six weeks; in the third, optic nerve atrophy.

"Traumatic affections of the optic nerve are frequently accompanied by oculomotor palsies and by deafness.

"Palsies of the Ocular Muscles.—After the facial, paralysis of the motor nerves of the eye are the commonest focal signs in fracture at the base. If variations in the pupils are considered as belonging to palsies of the motor nerves, then these latter are the most frequent focal signs of all. Irrespective of the condition of the pupils, the order of frequency of involvement of the motor nerves of the eye is the third, sixth and fourth. The third is sometimes, though rarely, affected in its entirety. Most frequently its injury shows itself as ptosis, usually unilateral but occasionally bilateral, which may occur in association with paralysis of the opposite extremities. Injury to the fourth has been very rarely recorded. It sometimes occurs in conjunction with other cranial nerve palsies, as in a case of Knotz, in which there was total ophthalmoplegia, interna and externa. The sixth is most frequently injured in connection with the seventh, both commonly being associated with deafness. The sixth is sometimes, also, injured alone, usually on one side, although bilateral palsies of it have been observed.

"The prognosis of these palsies is very good. It is rare for them to persist more than a few weeks or months as serious disabilities. Usually, in that time, double vision passes away, if it existed, and the eyelid, if there was ptosis, raises itself sufficiently for effective use. In most cases of traumatic ptosis, however, weakness sufficient for identification remains in the eyelid, although the patient may be unconscious of it.

"Abnormality of the pupils is the commonest sign of all. Some abnormality existed in 42 per cent. of my 68 cases, the most frequent condition being inequality. In the cases with hemiplegia the larger or dilated pupil was on the side opposite the paralysis of the extremities. It seems probable that, generally, though not always, the dilated pupil corresponds with the side of the greatest brain injury.

Certain conditions of the pupil seem also, from my cases, as of particularly grave significance. Of the cases with equally contracted pupils, five died and only one recovered. Of two patients with pupils immobile to light, both died. Of three with pupils changing at different times, so that they were contracted at one time and again dilated, presenting alternating myosis and mydriasis, all died."

An Operation to Enlarge a Contracted Socket, So that It May Hold a Glass Eye.

MAXWELL, PATRICK W., Dublin. (*The Ophthalmic Review*, May, 1903.) Referring to an operation to enlarge a contracted socket (described in *The Ophthalmic Review*, 1893, p. 189), which procedure was successful in result and permanency, the writer says:

"There were, however, certain disadvantages connected with the operation: (1) The bottom of the new sulcus was held down by a suture whose ends emerged on the cheek. The threads usually cut the skin and left two little marks. (2) The rotation of the skin bridge made a pucker at each end, which was never entirely flattened down. (3) The fixation of the ends of the bridge allowed the formation of a proper socket only in the middle. This, as a rule, made it necessary to order specially a more or less D-shaped glass eye, which was apt to turn round."

These disadvantages have led him to modify the operation; tried upon four patients, the results were most gratifying. The modified operation is described as follows:

"An incision is made in the floor of the socket and carried downward behind the lower lid. A semilunar flap about 8 mm. in width at its widest part is marked out on the skin, its upper concave border being about 5 mm. below the edge of the lower lid. The incision along the upper border of the flap is made to communicate with the bottom of the wound in the socket. The flap is now dissected up from the subcutaneous tissue, excepting a central area. The two ends of the flap are passed through the opening into the socket and sutured to each end of the socket incision, and the borders, being also passed through, are sutured to the borders of the socket incision. The space on the cheek is closed and the operation completed by putting in a temporary glass eye or shell. This should be as

nearly as possible of the size and shape as that which is to be ultimately worn. This glass eye prevents the new sulcus from being obliterated by contraction and gives it a suitable shape. It cannot safely be taken out for at least a week, as the skin incision might be opened in so doing. If there be secretion, the space behind can be flushed out by a lacrimal syringe armed with a fine curved nozzle, which can be introduced under the eye at the inner or outer canthus. A glass shell with a hole in front is preferable to a glass eye, because it allows a syringe to be more easily used, and, being transparent, a view of the parts behind can be obtained.

To get a good result the following points should be attended to:

“(1) Make the incision in the socket as long as the space will permit, and see that this length is maintained throughout its entire depth.

“(2) Make the skin flap considerably longer than the incision in the socket.

“(3) When dissecting up the skin flap, leave undisturbed a portion equal in length to the socket incision. This ultimately forms the fornix or sulcus. If a shorter portion is left the sulcus is apt to become V-shaped, which would require a specially made glass eye.

“(4) When closing the space on the cheek, as the lower boarder is longer than the upper, great care should be taken to equally distribute the excess, so as to avoid puckering. When this has been neatly done the line upon the face becomes quite invisible after a few months.

Should the operation have to be performed on a deeply sunk orbit, the procedure might be facilitated by a preliminary division of the external canthus.

In none of the cases as yet operated on has it been necessary to make a sulcus above. The same operation could, however, be performed on the upper lid, provided that, after dissecting back the upper border of the skin flap, the tendon of the levator was secured with one or two sutures before dividing it. After the skin flap was in its new position, the cut end of the levator could be attached to the tarsus. In closing the skin wound the ends of these deep sutures should be allowed to project outward, so that they could be pulled out when they ultimately become

loose. If really aseptic catgut could be obtained, the ends might be cut short and buried.

Besides providing a sulcus, the operation adds half the width of the flap, viz., 4 mm., to the vertical diameter of the socket."

**The Proper Division and Fixation of the Skin Flaps in
the Operation for Cicatricial Ectropium to
Prevent Re-eversion.**

HOTZ, F. C., Chicago. (*Archiv. Ophth.*, May, 1903.) While the immediate results of operations for cicatricial ectropium may be practically perfect, in a course of a few weeks the lid is found partly or completely drawn away from the globe again; especially is this so with the lower lid.

In the cicatricial ectropium of the upper lid, if the eye brows are absent, the cicatricial skin above the border of the everted lid can be utilized for the lid flap. "A semi-circular flap of suitable size, the basis of which is the free lid margin, is outlined in the cicatricial skin and dissected off down to the lid margin; and after the reposition of the lid, the edge of the lid flap is united with the upper border of the tarsus by three or four silk sutures." If on account of the eye-brows this can not be done, an incision is made close along the lid border, after reposition of the lid a Thiersch graft (on account of its thinness, lightness and adaptability to the surface) of suitable size is taken from the skin of the arm, smoothly spread out over the lid surface and fastened by fine silk sutures to skin edge of the free border on one side and to the upper border of the tarsus on the other side. "The lid margin is drawn beyond the horizontal line as far as possible and held in this position by two ligatures passed through the free margin and fixed on the cheek by plaster strips or collodion. This is done for two purposes: first to immobilize lid, and, secondly, to stretch the wound surface of the supratarsal region to its fullest capacity. Over this wound then a suitable Thiersch graft is spread so that its edges lap over the surrounding skin; no sutures are used."

"In cicatricial ectropion of the lower lid the same plan of division of fixation and of the skin flaps can be carried out successfully, only with this modification, that the lid

flap is not anchored to the tarsus but to the tarso-orbital fascia. The tarsus of the lower lid is very small and normally the lid skin reaches farther down than the lower tarsal border to a slight furrow a little above the infra-orbital margin, where the integument passes from the upright plane of the lid into the sloping surface of the cheek. This normal boundary between lower lid and cheek must be re-established, and therefore the lid flap must not be united with the tarsus but fastened to the tarso-orbital fascia in a line a little above the infraorbital margin. As the fascia is the anatomical continuation of the tarsus, the lid flap thus fixed lies entirely within the boundaries of the lid, and its contraction has no tendency to evert it. And the shrinkage of the large flap on the wound of the cheek is prevented from pulling on the lid margin and causing re-eversion because its traction cannot reach beyond the firm union of the lid flaps with the fascia. No amount of traction of the cheek has the slightest effect upon the lid flap or the lid margin.

In cutting the lid flap from the cicatrixical skin always present in the everted lower lid we must bear in mind that this skin contracts considerably as soon as it is dissected up. In order, therefore, to obtain a flap of suitable size, we begin the incision one centimetre from the outer canthus. This large flap is then dissected up from the underlying scar tissue, and all cicatricical strands and bands are cut until the lid is freed and can be turned up.

The next step is to reduce the overstretched lid margin to its proper length by removing a suitable piece of the lid (except the conjunctiva near the outer canthus). The lid is then drawn up as far as possible and held by two lagatures passed through its margin and fastened to the forehead. The edge of the lid flap is anchored to the tarso-orbital fascia by silk sutures (Fig. 2). The lid flap should be evenly spread out so as to be in perfect contact with the wound surface; but we must carefully avoid any undue stretching, and should we find that the flap is a trifle short and would be stretched if the sutures are placed very near the infra-orbital margin, it is better to put them through the fascia one or two millimetres higher up. For if the lid flap is unduely stretched, its subsequent contraction would unquestionably produce sufficient ten-

sion to draw the lid margin down to and cause a slight ectropium. Finally, the wound surface below is covered with a Thirsch graft, the edge of which is made to lap over the surrounding skin. No sutures.

The after treatment is the same for the upper and lower lid. Strips of gutta percha are laid over the flaps and upon these a suitable gauze compress wrung out of warm boric acid solution; this is covered by one large piece of protective to prevent evaporation, and over this a layer of cotton to maintain uniform warmth. This whole dressing is secured in place by a rolling bandage and left undisturbed for three days. Then it is carefully removed, the flaps are thoroughly cleansed, the overlapping edges of the large flaps are trimmed, and a new dressing is put on, which is changed every day or two as circumstances may require."

The Use of a Mydriatic After the Age of Forty-five.

STARKEY, H. M., Chicago. (*Journal A. M. A.*, April 25, 1903.) One hundred letters were sent out to the various ophthalmic surgeons throughout the United States asking the following questions:

"1. What is your practice in regard to the use of mydriatics or cycloplegics in refractions work in patients beyond 45 years?

2. If they are used frequently, what advantages and what disadvantages or dangers, if any, do you find in such use?

3. If they are used infrequently or not at all is their omission due to disbelief in their utility or to fear of bad effect?

4. Is the belief in the advantages and disadvantages theoretical or the result of your own experiences?

5. Can you cite cases in your own practice in which glaucoma has seemed to be cause or aggravated by the use of these drugs?

Ninty of the 100 to whom letters were sent replied. These replies are classified as well as may be according to the answer to the first question. Three classes are made: First, those who do not use them at all; second, those who use them rarely, and third, those who use them frequently. From the answer received a strict classification under these heads impossible, for it is doubtful if a

few of those put down as never using them do not on rare occasions employ them, and some of those noted as rarely using them may actually use them oftener than some of those who are noted as frequent users.

Classified in this way it is found that of the 90 replying 22 never use cycloplegics or mydriatics for refraction work after the age of 45, 32 use them rarely and 36 use them frequently. Of the first, 2 have used them repeatedly for experiment and have discontinued such use because they find they secure equally good results without them. Of the latter, 17 use them in a majority of cases at first examination. Where it is possible the ideas expressed by the answers were incorporated in a table of replies, but in some cases longer extracts were given below.

There is a very commonly expressed fear of glaucoma resulting from the use of these agents, but 25 state that they have no fear of producing increased tension in any case where there is not already the commencement of the glaucomatous process. Thirty-four have seen glaucoma caused or aggravated in their own practice and 11 have seen such cases in the practice of others, while 41 have seen no such cases. Thirty-six cases of glaucoma either produced or aggravated are mentioned. Some of these are reported most thoroughly and carefully.

CONCLUSIONS.

No age can be arbitrarily fixed beyond which cycloplegics must not be used, and while they are as necessary in certain cases after 45 as they are before, they are required in fewer and fewer cases as life advances. But since there is more danger of glaucoma in the elderly, and as mydriatics tend to increase the intraocular tension, these drugs should be used with caution after the age of 40, and in certain cases should not be used at all."

Carcinoma Epibulbare Planum.

MATYS, B., Prague. (*Jour. A. M. A.*, April 25, 1903.) Among the more frequent benign tumors occurring on the margin of the cornea where it joins the sclera, are "dermoid, fibroma and lipoma; the malignant forms being mainly sarcoma and carcinoma. The early diagnosis of these, especially the latter, is of the greatest importance,

since by its timely removal the eye may be saved and, according to the testimony of medical literature, without any recurrences. The epibulbar tumor in our case was flat, peculiar in appearance and color, unusual in this respect among the malignant forms, but certainly belonging to the epibulbar tumors. Noyes had met with only three cases in seventy thousand patients. In the out-department of the Bohemian Eye Clinic, Prague, thirteen cases have occurred out of a total of eighty thousand patients during the last ten years, and Professor Deyl, now at the head of ophthalmological clinic, affirms that he saw no such conjunctival tumor during his experience as assistant and in his polyclinic practice of fifteen years nor in his private practice, during which time he has observed or treated more than one hundred thousand cases."

The case under consideration occurred in a male, 78 years of age, occupation miller, condition in eye has existed about $1\frac{1}{2}$ years, there being pain, lacrimation, inflammation and slight failure in sight. The tumor located down and out was of general white tint, at limbus chalky white, surface slightly roughened, squamous, not ulcerated, extending from the cornea on which it encroached about 3 mm. to the external fornix, no arteries could be distinguished and the tumor was hard and movable; the eye was myopic, had an incipient senile cataract and vitreous opacities $V = 5/30$ with $-2.00 D = 5/15$. "The tumor was removed by one cut with Graefe's knife after the conjunctiva had been severed with the scissors around its entire margin. This enabled us to see that the tumor had been connected at its base with the limbus; in the inferior external quadrant it had been connected with the sclera only by a pedicle corresponding in place and size to the thickest portion of the tumor. These points or places of attachment were scraped with a sharp spoon, followed by cauterization. The entire wound was covered with the adjoining conjunctiva, held in place by two stitches. The wound healed in a week's time. After the operation the growth was put into 5 per cent. formalin alcohol. It was next put into celloidin, then the entire tumor was cut in the usual way with the microtome and stained with hematoxylin and paracarmin.

Microscopic examination of the tumor while cutting it

revealed its varying thickness, ranging from 3 millimetres, located as stated in the external inferior quarter, to the thinnest portion extending over the sclera and along the limbus, measuring $1/2$ millimetre or even less. The greatest diameter of the tumor was 2.5 cm.

The microscopic examination showed us that the tumor is a carcinoma, as it contains cell nests containing the colloid material in the epithelial bands and its extension in all directions is also characteristic of canceroid tumors. But ulceration, which is so common in carcinoma, does not appear to have occurred.

In our case, as is usually the rule in epibulbar tumors operated on late, there was a recurrence on the sixteenth day after the operation. In the inferior external quadrant of the cornea a small point or macula about 1 millimetre in diameter made its appearance and was again removed and the spot cauterized. The microscopic examination of this recurring growth showed the structure as the original tumor."

Six weeks later three points of recurrence are again removed. Five months after the first operation the patient returned with two recurrences, one at the limbus about 5 mm. in circumference and one in the conjunctiva 2 mm. in size. The patient was not in condition for an operation, so a conservative plan of treatment was adopted, as the eye had good vision.

"In our patient there appeared to be a direct relation between the carcinomatous tumor and angioma contrary to the recently expressed opinions in the literature on the subject of angioma and telangioma. It was noticed that our patient had some small pin-head angiomas in the skin of the breast and also very numerous small lentigines. As regards the statistics of carcinoma it may be remarked that in this region such epibulbar tumors are very infrequent. This rare case is published mainly on account of the practical points involved. As regards its etiology, it may be said that we found nothing giving evidence either in the clinical or microscopic examinations of any parasitic origin."

Special attention is called to the fact that very many incipient tumors in this position are neglected by being confounded with phlyctenular ulcer in the limbus and also vernal catarrh and sarcoma.

A Note on the Use of Jequiritol and Jequiritol Serum.
(Merck.)

WOOD, CASEY A., Chicago. (*Ophthalmic Record*, June, 1903.) The following is translated from Merck's circular:

"Jequiritol and jequiritol serum were introduced into ophthalmology by Dr. Roemer of Wurtzburg—for particulars his article on the subject is recommended.

It is used in the treatment of such forms of chronic inflammation of the eyes as, formerly, the infusion of jequirity was used.

The new method is so much superior to the old that its introduction into practice must be looked upon as a decided advance in the conduct, especially of pannus and other trachoma sequelae. Jequiritol is an extract made from the seed of *abrus precatorius* after several improved methods and particular precautions. It is used in a sterile solution mixed with 50 per cent. glycerine so that an exact dose can be given without evil effects, which was not possible with abrin or the old infusion. It comes in four different degrees of strength. No. 1 is the standard strength. A subcutaneous injection of 0.01 ccm. of this solution kills a white mouse, weighing 20 grams, in four days. The strength of the others is on the label. The jequiritol serum is made on the Behring principle, like the abrin serum of Ehrlich, which has the power of neutralizing the poisonous effect of jequiritol when applied locally to the human conjunctivae, or given hypodermically. This is mixed with 0.25 per cent. carbolic acid and 1.1 ccm. will render immune a mouse against 100 times the usual lethal dose, when both are mixed and given subcutaneously.

Directions for use (Roemer): A single drop (0.01 ccm.) of No. 1 is dropped into the eye by means of the capillary tube. If nothing happens, the dose must be daily increased until a typical jequiritol inflammation is set up. Sometimes no reaction occurs until No. 2 is used, when the acute inflammation is finally induced, and subsides in a few days; then the eye will stand a still stronger dose. Immunity is obtained after a number of inflammatory attacks, and at last the strongest dose produces no effect. In this way treatment goes on, allowing the absorption of trachomatous exudates, pannus, corneal opacities, etc. If

twenty-four hours after the employment of a dose the inflammation appears to be too severe, several drops of the jequiritol serum should be instilled into the eye frequently during the day. If these directions are carefully followed, it will rarely happen that the subcutaneous employment of the jequiritol will be required. The results in the very chronic cicatricial forms of trachoma with old pannus are extremely good.

On the neck of each vial will be found an etched ring and at one point in it a notch made by a file, at which the top can be readily broken. The neck of the bottle is covered with a glass cup which afterward serves for a cover. The pipette should be cleansed *after* using. No alcohol or carbolic acid should be employed *before* using, as these agents coagulate the jequiritol. Dr. Roemer's first article is entitled, Experimentelle Untersuchungen über Abrin—(Jequiritol)—Immunität als Grundlagen einer rationellen Jequirity-Therapie. Graefe's Archiv für Ophthalmologie. Band LII. Heft 1, 1901."

A Test for Central Color Perception.

FRIDENBERG, PERCY, New York. (*Archiv. Ophth.*, May, 1903.) The writer remarks upon the inadaptability of the perimetric method for detecting small central color scotomata; and also that it is the only method mentioned in most text-books on ophthalmology. It is necessary in order to obtain reliable answers in testing for central color perception to have perfect fixation, which is very hard to obtain with the perimeter; and as the test object is brought in from a normal periphery, the patient learns the color of the target before it reaches the macula. Both objections may be removed if we keep the subject in ignorance of the color of the test-object until it is presented for inspection with the macula and, using small targets, expose them to view for a moment only while the point at which they are to appear is firmly fixed. Recognition by normal eyes is virtually instantaneous, and before a color-defective macula can be moved by aiming the eye anew and bringing another portion of the retina into action, the target has disappeared. Absolute fixation is assured by standing opposite to the patient with one's own line of vision meeting his, and bringing the test-object to a point where it is

fixed by both subject and examiner. The slightest deviation of the eye of the former will at once be detected, and the target is not exposed until this is remedied. In practice the test is applied as follows: The test-objects are small, about 4 mm. square, cut out of variously colored paper or cardboard. These are held in the palm of the left hand, hidden from the patient's view. With a small forceps, held between the thumb and third finger of the right hand, one of these color-squares is picked up and the index finger extended over it so that it is still covered when the hand is held up before the patient, who is told to look sharply at the tip of the index finger. When convinced that fixation is absolute the target is exposed momentarily by flexing the finger and sliding it down along the forceps returning it immediately to the first position, hiding the test-object. The latter can thus only have been seen by the macula as it occupied exactly the same position as the finger-tip which was being sharply fixed and was covered before any correcting motion of the eye could be made. I desire now to present an instrument which embodies the same principle in a convenient and ready form. The color-carrier is much like an ophthalmoscope in general appearance, except that red, green, blue, yellow and white color discs take the place of lenses, and that there is, of course, no mirror. The front of the instrument (Fig. 1), which is to be presented to the patient, has an aperture 8 mm. in diameter, which can be reduced by a sliding quadrant with openings, 1, 2, 3 and 4 mm. in diameter. The aperture is ordinarily covered by a shutter moving vertically in a spring-slide. The fixation point is marked by a white dot. Drawing down the slide uncovers the aperture, occupied by whichever color-discs has been rotated into position. When the slide is released, the shutter immediately springs back into its original position and again covers the aperture. The "exposure" may thus be made instantaneous, or if desired, it may be indefinitely prolonged.

X-Rays in Tuberculous Conjunctivitis.

STEVENSON (*New York and Philadelphia Medical Journal*) reports a case of tuberculosis of the conjunctiva, occurring in a girl aged four years, which was cured by

the use of the x-rays. The disease had lasted two months. The palpebral conjunctiva was bestrewn with miliary granulations and folds of cockscomb-like tissue. The sub-maxillary glands on the same side were enlarged. Tubercle bacilli were found in sections of the granulations, and inoculation into a rabbit's eye resulted positively. The affected conjunctiva was exposed to the x-rays at a distance of six to ten inches from the focus tube, for an average period of ten minutes at each sitting. Nine such exposures were made in the course of a month, when the conjunctival malady was practically cured. The enlarged glands, however, became larger and were eventually removed.

**Case of a Man Blind from Congenital Cataract, Who Acquired Sight After an Operation When he was
Thirty Years of Age.**

RAMSAY (*Lancet*, May 16, 1903—*The Ophthalmoscope*.) gives a graphically written account of an intelligent man, now thirty years of age, who was born blind. Notwithstanding this disability, the man managed to perform almost skilled labor, and to get about his native village in an extraordinary way. The eyes were small, moved aimlessly in the orbits, and showed an alternating convergent squint; the crystalline lenses were completely cataractous; perception and projection of light were perfect. At an interval of a week between the two operations, Ramsay removed the cataracts from both eyes. For about ten days after the operation on the left eye the patient appeared to be dazed and unable to realize that he was seeing. The first thing that he recognized was the face of the house surgeon, and red was the first color. The most difficult color he found to be green, but he is now able to name all the ordinary tints correctly. On the first occasion he saw yellow he became so sick that he thought he would vomit. The patient quickly learned his letters, and he will soon be able to read. From the first he saw everything in its actual position, thus showing that the retinal inversion of an image is interpreted psychically, without any education. Size and distance were estimated better than might be anticipated. The patient has still very little control over the movements of his eyes. The *fundi oculorum*, however, appear to be normal.

ABSTRACTS FROM AUSTRO-HUNGARIAN OPHTHALMIC LITERATURE.

BY

J. GUTTMANN, M. D.

NEW YORK.

(Quarter ending June 30, 1902.)

Ophthalmoblenorrhoea Neonatorum.

MOHR, MICHAL. (*Pester Medizinisch Chirurgische Presse*, May 10, 1903.) F. Jaeger was the first one to discover that gonorrhoea could be transmitted to the eye. Piringer, in 1839, had already pointed out that this affection could only be produced by bringing particles of secretion in contact with the conjunctiva. In 1879 Neisser recognized the cause of the infection as a specific diplococcus which is found in the pus of the urethra or vagina, or in the secretion of the eyes affected with blenorrhoea. The diplococci are found in the epithelium or in the pus cells. In doubtful cases the presence of the diplococcus is diagnostic.

The author then gives the clinical history of the disease. He states that in some cases the symptoms are those of blenorrhoea; where the diplococcus is absent, he considers the cases as ophthalmoblenorrhoea and not gonorrhoea. He examined all the cases as ophthalmogonorrhoea for gonococci; these examinations gave a negative result in only 12.6 per cent. of all the cases. This high percentage of negative results was caused by the fact that some of the cases were examined in the eighth or twelfth week of the disease, at a time when the gonococcus had already disappeared from the secretion. In the examination of cases of only two weeks' duration the gonococci were absent in only 6 per cent. of the cases.

As regards the prognosis in these cases it is very im-

portant whether or not there are corneal complications. All of his cases with corneal complications were at least one week old when he had first seen them, except one case which was only two days old; in this case there had probably been an intra-uterine infection.

In 10,466 cases of affections of the eye he found 404 cases i. e. 3.88 per cent. suffering with ophthalmo-blenorrhea. He considers the cause of blindness in 10.8 per cent. of these cases as due to blennorrhea neonatorum.

Prophylaxis is a very important factor in this affection. He considers Credé's method of instillation of a drop of a 2 per cent. solution of silver nitrate into the eyes of the newborn as one of the greatest achievements of modern hygiene. Since this method has been instituted the number of these affection has decreased from 9.23 per cent. to 0.65 per cent. Several authors opposed this method. Milbrand found maceration of the cornea after instillation of silver nitrate solution. Förster found discoloration of the cornea in some cases. Others attempted to substitute sterile water for silver nitrate but the morbidity increased to 17 per cent. Other substitutions were carbolic acid with 3-13 per cent. morbidity, and trichloride of iodine with 1-1.4 per cent. whereas Credé's method gave only a morbidity of 0.6 per cent.

After having dealt with the prophylaxis the author describes the treatment of the condition, and begins by impressing the importance of increasing the vitality of the child by proper nourishment. For the cleansing of the affected eyes he first tried asepsis and used sterile water, with the result that in several cases corneal complications set in. He then employed a solution of corrosive sublimate 1:5000 every 10 minutes. With this method of corneal complications were avoided. In addition to this he employs applications of ice to the eye, and touches the conjunctiva with a one per cent. solution of silver nitrate.

Blenorrhea Neonatorum.

ROSNER, ALEXANDER, DR. (*Medizinische Blätter*, April 16, 1903.) Credé in 1881 published his method of preventing the above mentioned disease. After enumerating the numerous attempts at opposing to this method, especially

by Carl Schröder, professor of obstetrics at Berlin, the author comes to the conclusion that a ten per cent. solution of protargol is the best substitute for silver nitrate. The drug is just as efficient as the nitrate of silver, and does not possess any irritating effect. Protowski used protargol in 1030 consecutive cases of newborn infants, with no per cent. of ophthalmic blenorrhea.

Experience in the Use of Some New Remedies in Oculistic Practice.

KONIGSTEIN, L., PROF. (*Wiener Medizinische Presse*, Feb. 15-April 15, 1903.) Two or three decades ago ophthalmic medication consisted mainly in the use of atropin, silver nitrate and mercury. The most important of these was atropin; it was used in nearly every affection of the eye and, consequently, very often abused.

The next important drug in the trial was silver nitrate; the "lapis mitigatus," "lapis infernalis," and the silver solutions of high percentage were used indiscriminately in every inflammatory affection of the conjunctiva, so that the patients suffered more severely from the treatment than from the disease itself.

The third one of these, mercury, was employed in various ways; by friction, subdermatically, by subconjunctival or intravenous injection, and even by inhalation. Aside from this, the drug had a potent rival in iodine, which was used either alone or as a substitute for mercury, or together with it in specific affections of the eye.

Among the newer remedies much in vogue to-day, cocaine ranks first. The author gives the following indications for its use: 1, as an anesthetic; 2, as an analgesic; 3, as a mydriatic for ophthalmoscopic examinations; 4, as a cosmetic; 5, as an irritant in paresis of the sympathetic, and, finally, as an anemic agent. He then deals at length about the operations in which cocaine can substitute general narcosis. He thinks that cocaine may be used in all operations on the eye, especially when combined with suprarenal extract or adrenalin, even in the enucleation of eye bulb.

As an analgesic, he thinks, when used with certain precautions, that is, with the eyelids closed, no untoward effects follow. He gives the drug to the patient to be used

at home, especially when the ordinary analgesic measures, such as cold or hot applications, belladonna and opium ointment are of no avail. To produce an analgesic effect deep in the eye bulb, he uses aconin and dionin. Cocain is an excellent analgesic, in combination with eserin, in the painful condition caused by an attack of glaucoma. Lately certain substitutes for cocain have been recommended; these have some advantages, but also many disadvantages, so that cocain still remains the most frequently employed remedy in the hands of the oculist.

The second new drug is adrenalin. This was introduced into ophthalmic practice by Bates, in New York, six years ago. He first made use of suprarenal extract, which is now substituted for adrenalin. The latter is superior to all other drugs of a similar nature in the market. The author then describe the properties of adrenalin. It is one of the strongest agents causing anemia of mucous membranes. He uses adrenalin in conjunctivitis simplex and phlyctenularis; in cases of pterygium, keratitis vascularis superficialis and interstitialis, in iritis, glaucoma, episcleritis, scleritis, etc. Inasmuch as adrenalin is a constrictor of the blood vessels, but not an astringent, the cells not being affected by it, he uses adrenalin in combination with zinc as an astringent; he also combines adrenalin with calomel and yellow ointment.

In affections of the cornea, adrenalin acts only symptomatically and as an adjuvant. In glaucoma, it is used in combination with a myotic. Combined with cocain, it increases the effect of the cocain to a great extent. Adrenalin is also employed by the author for diagnostic purposes, to determine whether an injection of the blood vessels of the conjunctiva is caused by the ciliary or by the superficial blood vessels. He finds the drug very useful in the treatment of "spring" catarrh of the conjunctiva. Combined with cocain, it gives very good results in probing the tear duct.

Adrenalin is also a cosmetic, as it enlarges the palpebral fissure more than cocain.

Another new remedy is dionin; it was described by Wolfberg in 1899. He used it in substance, then in 2, 4 and 10 per cent solution. The author cites the experiences of Darier, Graefe, Daxenberger, and others, with this rem-

edy and then gives his own. In the beginning he used it in powder form; immediately after the application the eyes begin to burn and tear, the margins of the lids become swollen and edematous, the conjunctiva is red, the blood vessels injected and the cornea begins to shine. The swelling is not localized only in the lids, but it extends also to the skin of the forehead, to the lids of the other eye and down to the cheek. The conjunctiva forms a chemotic wall around the cornea and protrudes from the palpebral fissure. The pupil is not affected. The duration of this stage varies from 2 to 24 hours, and depends upon the strength of the drug used, and upon the susceptibility of the individual; in old, weak, cachectic or lymphatic individuals the reaction is stronger. The second or third application of the drug has a less irritating effect, as the eye becomes addicted to the drug, and after a while the drug ceases to irritate the eye at all.

The writer uses this drug in all forms of keratitis; in some cases with excellent results, especially in keratitis parenchymatosa at the beginning of the affection. In old cases the drug has no effect at all. In phlyctenular affections the effect varies. In diseases of the conjunctiva it is contraindicated. In iritis the results were good, as not only did it stop the pain, but also shortened the course of the process. It is very efficacious in glaucoma hemorrhagicum. Many authors obtained good results with dionin in chorioiditis, in retinal hemorrhages and in opacities of the vitreous. In cataract operations it facilitates the absorption of lens residue, especially in cases of extraction of the lens for high degree of myopia. It has one disadvantage and that is by causing frequent sneezing, in some individuals, it might cause rupture of the wound.

The effect of dionin is due to the fact that: 1. It produces changes in the epithelium of the capillary vessels, and through this causes an abundance of secretion of the blood-plasma into the loose connective tissue, and thus a venous stasis; this abundance of secretion causes improved nutrition in the cells and an excretion of the pathological products. 2. The circulation of the lymph in the anterior part of the eye is accelerated, and this exerts a beneficial effect on the posterior part of the eye bulb. 3. The stasis in the lymph channels produces pressure on the

nerve ends, and thereby a temporary paresis. These explain the analgesic effect of the drug. The drug should, therefore, be employed: 1. Where we wish to produce a speedy resorption of the inflammatory products and serous exudates and 2. Where a long lasting anesthesia is desirable.

Some other important new remedies in ophthalmic practice are protargol and largin. In the last few years several new remedies were produced as substitutes for silver nitrate, such as argentamin, argonin, itrol, albargin, etc., but all of these were superceded by protargol and largin. The author after describing the chemical and physiological properties of the two drugs, concludes that both of them have about the same advantages and disadvantages. He then cites the opinions of several writers in favor of these drugs, then of those opposed of their use; the latter claim that protargol is far inferior to silver nitrate.

Protargol, according to some observers, is to be preferred to silver nitrate for following reasons: 1. It is an excellent disinfectant. 2. It does not possess irritating or caustic qualities. 3. It does not decompose. 4. It is harmless, even in the more concentrated form. 5. It does not cause argyrosis, nor does it soil the linen. 6. The manipulation with protargol is much easier. The author, however, denies that the drug is as potent a disinfectant as silver nitrate, and as regards it being non-irritating, he states, that he found the pain to vary in different individuals. He is inclined to ascribe the possibility of its being less painful to the fact that it contains only about 8 per cent. of silver against 63 per cent. of the metal in the nitrate of silver.

He also finds that protargol decomposes easily; the yellow solution becoming darker in color on prolonged exposure, even if kept in colored bottles. According to the author the drug produces argyrosis and soils the linen. The reason that the drug is more beneficial in the treatment of the urethra than of the eye, is because the injected fluid remains much longer in contact with the mucous membrane in the urethra than in the eye, and thus its effect on the deeper tissues is more marked.

In conclusion he states that although protargol and largin will not be able to replace nitrate of silver, still they

will be employed as good adjuvants to the above named drug.

Ablatio Retinae Cured by Operation.

MILLER, LEOPOLD, DR. (*Wiener Klinische Wochenschrift*, April 30, 1903.) The author recites the history of a patient, who, after having had the myopia of 9 dioptries of his right eye corrected, had normal vision until June, 1901; his left eye was amblyopic. On that day while the patient was passing an examination, he suddenly lost the vision of his right eye. He was treated by pressure bandages, rest and diaphoretics, but with no result. The patient could distinguish fingers only in a downward direction.

In June, 1902, a year after the onset of the affection, the patient was operated upon for detachment of the retina in the following manner. At first the author made a temporary resection of the outer orbital wall, after Kronlein's method; then he incised the orbital periosteum, laid bare the rectus externus and severed it. The obliquus inferior was also severed from the eye bulb. Now came the main operation. A piece of sclera 10 mm. broad and 20 mm. long was cut out of the outer side of the eye bulb; the anterior margin of the excised portion of the sclera was 1 to 2 mm. behind the attachment of the rectus externus, the posterior margin in the region of the equator of the eye bulb. Through the margins of the scleral wound 5 silk sutures were inserted. All this was done without the slightest injury to the chorioid. After this a thin knife was passed through the chorioid, in the lower angle of the wound, and by tying the suture the subretinal fluid was evacuated. The result was excellent. The retina again attached itself completely and the field of vision became normal. The visual power increased so much that the patient could count fingers at 3 m. distance; a central scotoma preventing the entire improvement of his power of vision.

The writer operated in the above manner upon 7 patients. The first patient was operated fifteen months ago, and the result is still very good.

OPHTHALMIC NEWS, ITEMS AND ANNOUNCEMENTS.

(Under this heading the ANNALS will publish items of interest. Please address Dr. B. E. Freyer, 520 E. Ninth Street, Kansas City, Mo.)

Dr. H. V. Würdemann, has returned from his trip in Europe.

Dr. O. F. Wadsworth, has resigned his professorship of Ophthalmology in Harvard University.

Dr. Haltenhoff, was recently appointed professor of ophthalmology at the University of Geneva.

Dr. Arnold Knapp, son of the world renowned Dr. Herman Knapp, has been elected professor of ophthalmology at the Columbia University.

Dr. Eugene H. Oppenheimer of Berlin, Germany, has joined the staff of the ANNALS, and will contribute abstracts from German Literature.

New Hospital in Washington.—On June 6 the cornerstone of the new Episcopal Eye, Ear, and Throat Hospital was laid with appropriate ceremony.

Dr. P. H. Fridenberg of New York City is now associated with Drs. May and Black in the conduction of the department of American and English abstracts.

We would announce the appearance of a new Journal on the eye, "The Ophthalmoscope." The editor is Dr. Sydney Stephenson, with Dr. C. Devereux Marshall, sub-editor.

Dr. J. Elliot Colburn has resigned as Professor of Ophthalmology in the Chicago Polyclinic, and has been elected Professor of Ophthalmology in Chicago Eye, Ear, Nose and Throat College.

Dr. W. H. Schutz has been elected Professor of Ophthalmology and Otology in the Kansas City, Kansas, College of Physicians and Surgeons and Surgeon in Chief of the Eye and Ear Department of Bethany Hospital.

The officers of the Ophthalmic Section of the American Medical Association are for the current year Dr. R. L. Randolph, of Baltimore, president; Dr. E. A. Bulson, of Fort Wayne, secretary; Dr. Casey A. Wood, delegate.

Damages for Loss of Eyesight.—The Appellate Court of Indiana, in the case of Van Camp Hardware Company vs. O'Brien, allowed \$25,000 damages in the case of a girl 9 years of age who lost the sight of her left eye by accident.—*Amer. Med.*

The Eye, Ear, and Throat Society of Washington.—At a meeting of this society, held May 22, the following officers were elected to serve during the coming year President, Dr. Walter A. Wells; Vice-President, Dr. W. N. Suter; Secretary and Treasurer, Dr. H. O. Polkinhorn.

The ANNALS takes pleasure in informing its readers that an important addition has been made to the staff in securing Prof. Dr. M. Wickerkiewicz, of Cracow, Austria, who will shortly take charge of the department for abstracts of Russian and Scandinavian Literature.

Trachoma Bars Immigrants.—The Hamburg American Line steamship "Armenia," Captain Falk, which arrived from Hamburg via Halifax, had on board 21 Russian Jews, all men, whom the Canadian Immigration Commissioner debarred because all are suffering from trachoma.—*Amer. Med.*

In Berlin the number of school-doctors has increased by 24, now numbering 36. Each one receives \$500 annually and has two double schools (about 4,000 pupils) under his charge. Oculists have not yet been appointed. In Germany specialists are used to doing work for nothing—for the glory and so on.

New Blind Asylum.—The legislature has passed the bill authorizing the sale of the asylum for the blind property in St. Louis and the purchase of a new site. The bill carries an appropriation of \$150,000. Under the provisions of the bill a commission of three will be appointed by the governor to take charge of the matter.—*Jour. A. M. A.*

American Ophthalmological Society.—At the meeting held in Washington, the following officers were elected for the ensuing year: President, Dr. Charles Stedman Bull, New York; first vice-president, Dr. Arthur Mathewson, Brooklyn; corresponding secretary, Dr. J. S. Prout, Brooklyn; recording secretary and treasurer, Dr. S. B. St. John, Hartford, Conn.

The Section of Ophthalmology in the forthcoming meeting of the British Medical Association at Swansea promises to be of much interest. Mr. H. E. Juler is president, with Messrs Jabez Thomas, of Swansea, T. H. Bickerton, of Liverpool, and Dr. Freedland Fergus, of Glasgow, as vice-presidents. The honorary secretaries (to whom communications should be addressed) are Messrs. H. C. Ensor, 23 Winsdor Place, Cardiff, and W. T. Lister, 30, Queen Ann Street London.—*The Ophthalmoscope.*

Adulteration Causes Blindness and Death.—A correspondent sends the following extracts from the "Waukon Standard," suggestion that the result may have been due to lemon extract made with wood instead of grain alcohol: "Clarence Floyd, a printer and newspaper writer of Center Point, Iowa, died last week after a protracted period of heavy drinking. Lately he had been unable to purchase liquor, no one daring to sell it to him, but somehow he got a hold of two dozen bottles of lemon extract. He drank all but three or four of these bottles, and he went blind on the streets of Vinton. Then he grew violent and physicians were summoned. They could do nothing for him, and he died in horrible agony.—*Jour. Amer. Med., April 4, 1903.*

The Index Medicus.—The first number of this resuscitated publication, that for January, has recently been issued, and it is provided that succeeding numbers will be issued rapidly

up to the even date. The subscriptions have not yet reached a sum sufficient, when added to the \$10,000 per annum appropriated by the Carnegie Institute, to pay for the cost of publication, and an appeal is made to the profession throughout the world to support the enterprise. The Philadelphia College of Physicians recently adopted a resolution calling upon each of its Fellows to subscribe, if within his power, for at least one copy.—New York Medical Record.

Myopia and School Life.—Examinations of over 200,000 pairs of eyes and careful tabulation of the results, in the Boston public schools, show that nearly all children enter the primary schools with normal eyes. In the higher grades one-fourth of the pupils are myopic, and in universities this increases until from 60 to 70 per cent. of the students are myopic. In other words, nearsightedness increases steadily from the lower to the higher grades, and in exact proportion to the length of time devoted to the eyestrain of school life.—(*Annals of Gynecology and Pediatrics*, Boston, Mass., May, 1903.)—*American Medicine*.

The annual meeting of the Georgia State Medical Association took place at Columbus on the 15th, 16th and 17th of April. The papers on ophthalmological subjects were, wisely, we think, written with a view to interesting the general practitioner, and, therefore, were hardly suitable for publication in the special journals. The members were most hospitably received, were entertained at a handsome banquet, at an enjoyable "smoker," and by an excursion by boat on the Chattahoochee river. Those who drove outside the city saw something of the mansions of the rich "fo' de wah" planters, standing frequently in groves of beautiful trees. Columbus is becoming a great center of cotton manufacture.

Manhattan Eye and Ear Hospital to be Built Anew.—It has been announced that the Manhattan Eye and Ear Hospital has chosen a new site, and will erect new commodious buildings to cost not less than \$200,000. The present site on Park avenue and Forty-first street will be abandoned, and a less valuable location will be chosen for the new structure. The hospital now has an endowment of \$171,000, and an additional sum of \$200,000 is needed. One of the directors has

offered \$50,000 of this sum provided the other \$150,000 shall be raised by January 1, 1904. The great increase in eye and ear diseases, particularly the latter, in New York within the past year has caused such an overcrowding of the Manhattan Eye and Ear Hospital as practically to force the abandonment of the old institution and erection of more commodious quarters.—Amer. Med.

Ophthalmia in Egypt.—According to the *Lancet* a meeting was held recently in Cairo, Egypt, to discuss the disposal of Sir Edward Cassell's gift of \$200,000 for the relief of ophthalmia in that country. It was proposed to create an "Ambulatory Dispensary", which would consist of a tent in charge of an inspector and officer, appointed for a term of three years. By the adoption of such an "ambulatory dispensary", they would be enabled to travel around the provinces and give special attention to diseases of the eye without putting the patients to the inconvenience of traveling any distance to receive treatment. The idea is to have the inspector work for two months in the province and then one month in Cairo. This plan, however, is only tentative and will in all probability not be accepted, as it has many objectionable features, among which is the inability to perform properly in a tent operations upon the eye.—Amer. Med.

Sudden Blindness After Paraffin Injection.—Dr. Lee Maidment Hurd reported to the section on Laryngology and Rhinology of New York Academy of Medicine on May 27 a case in which there has been instant loss of vision following a paraffin injection for nasal deformity. The patient was a man of thirty-three years without any history of syphilis, whom he had given, some months previously, two or three injections of paraffin with the object of improving nasal deformity. The man returned requesting another injection, and while this was being given he became blind. Ophthalmoscopic examination revealed the typical appearance produced by embolism of the central artery of the retina. While the possibility of this accident being a mere coincidence was freely admitted, the opinion seemed to prevail that it was directly connected with the paraffin injection. The blindness is permanent.—Jour. A. M. A.

The Academy of Ophthalmology and Oto-Laryngology.—At its recent meeting held at Indianapolis, April 9th to 11th, the Western Ophthalmologic and Oto-Laryngologic Association adopted a new and broader constitution and changed its somewhat unwieldy name to that of the "Academy of Ophthalmology and Oto-Laryngology." The meeting was a very successful and instructive one, and the entertainments prepared by the local profession were highly enjoyable. The Academy elected the following officers: President, Dr. Edward Jackson, Denver, Col.; 1st vice-president, Dr. D. S. Reynolds, Louisville, Ky.; 2d vice-president, J. J. Kyle, Indianapolis, Ind.; 3d vice-president, Dr. J. W. Murphy, Cincinnati, O.; secretary, Dr. D. T. Vail, Cincinnati, O.; treasurer, Dr. J. O. Stein, Chicago, Ill.; Council, Dr. Adolf Alt, St. Louis, Mo.; Dr. W. Ballenger, Chicago, Ill.; Dr. Casey A. Wood, Chicago, Ill.; C. R. Holmes, Cincinnati, O.—American Journal of Ophthalmology.

A unique dinner was given April 14th last by the St. Louis Medical Society to four of their ex-presidents, all of whom were over eighty-six years of age. Dr. Simon Pollak, one of these honored guests, was born in Prague, April 14th, 1814, so that the banquet may have been said to be especially his, as it was given on his eighty-ninth birthday. The venerable doctor graduated in 1835 at the University of Vienna, and arrived in the United States in 1837. From 1838 to 1844 he practiced medicine at Nashville, Tenn., where he acquired a competence. He came to St. Louis in 1845, where he has since remained. Immediately he entered upon dispensary work, and in 1852, together with James Yeatman, William G. Eliot and others, he founded the Missouri School for the Blind. By Dr. Pollak's personal efforts this school was financially maintained for five years, when it became a state institution. About 1850 he assisted in founding the St. Louis Academy of Science. In 1860 he started the eye and ear clinic at Mullanphy Hospital, the first in St. Louis, and has looked after it until the present. * * * *—Ophthalmic Record.

The Berlin Ophthalmological Society now embraces nearly all the oculists of Berlin, about 30 new members having recently joined; the total number of members is about

75. Von Michel was elected 1st chairman; Hirschberg, the former one, 2nd, and Greeff, 3rd. The meetings are no longer held in Hirschberg's clinic; they are now in the University Clinic (v. Michel), once a month. Strangers are allowed to attend, upon introduction, and are always gladly welcomed.

Besides this scientific society, a more "material" society has been organized in Berlin, the "Wirtschaftlicher Verband der Augenärzte Berlins und Vororte." About 75 Berlin oculists have joined this club; about 15 still stand aloof. The object is to stand together against certain organizations and the illegal competition of some opticians. The future will show up whether "unitis viribus" counts among the oculists.

A Peripatetic Eye Clinic.—It is stated in the *Lancet* that Sir Ernest Cassel has given a large sum of money to the Egyptian government for the relief of ophthalmia in Egypt. In order to expend the money to the best advantage, it has been decided to send traveling dispensaries into the country for the relief of those sufferers who are unable to attend the already existing hospitals. There will be at first one of these dispensaries or ambulance hospitals, which will have a couple of tents with beds for patients who have to be operated upon, and for the treatment of the more serious cases. This will travel about from place to place under the direction of an ophthalmic surgeon, who will have under him an Egyptian assistant surgeon. Mr. A. F. MacCallan, chief clinical assistant at the Royal London Ophthalmic Hospital (Moorfields), has been appointed by the Egyptian government to organize and to direct the enterprise, with the title of "inspector of traveling ophthalmic dispensaries in Egypt." If this experiment is successful, other dispensaries will be organized and sent on their travels.—*New York Medical Record*.

Memorial to the Late Professor Panas.—"The colleagues, friends and pupils of Professor Panas have decided to open a subscription for the purpose of perpetuating the memory of their beloved master. The committee intend to have a medal struck and place a monument in the principal hall of the Ophthalmological Clinic of the Hotel Dieu, where, for twenty-two years, Panas labored so successfully and so

assiduously. Subscribers of at least twenty-five francs will receive a copy of the medal. Contributions should be addressed to one of the secretaries, Monsieur Monthus, 41 rue Godot-de-Mauroi, Monsieur Scrini, 51 Avenue Gabriel, Paris, who will have charge of the funds. We trust you will join us in honoring the memory of the man whom French science has so recently lost."

The circular is signed by the honorary presidents: Prof. Brouardel, honorary dean of the (Paris) Medical Faculty; Prof. Debove, dean of the Medical Faculty; Delyane, minister from Greece in Paris; Prof. Jaccoud, permanent secretary, and Lancereaux, president, of the Academy of Medicine. President: Prof. Guyon, member of the Institute of France. Among the vice-presidents is Prof. Gayet, of Lyons. Of the members, Drs. Albarran, Barette, Chevallereau, Corgialequo (London), Daviel (Rouen), Druault, Professors Fuchs, of Vienna, Hirschberg, of Berlin, and de Laperonne, of Paris. Dr. Menacho, of Barulona, Prof. Pflueger, of Berne. Drs. Phronimos, of Cairo, Rochon-Duvigueaud, Sourville (Nantes), Prof. Tartuferi, of Bologna, Dr. Terrien and Prof. van Duyse, of Ghent.

Copper Citrate in Eye Diseases.—Krotoff has used copper citrate in 109 cases of eye disease, and presents the results of his investigations. Copper citrate was discovered in 1832, by Gay-Lussac, and occurs as a green powder devoid of odor or taste, soluble in water in the proportion of one part in 9143, and in salt solution in the proportion of 1-7700. It contains 35.69 per cent. of copper. In order to determine the bactericidal properties of this substance, the author experimented with various germs, and found that a solution of 1-9143 killed the *staphylococcus pyogenes* in from three to six and a half hours; the *bacillus pyocyaneus* in seven hours, etc. Ointments containing copper citrate in use for a month were found sterile. The remedy was used in the following forms: (1) A 5 or 10 per cent. powder with sugar. (2) A 5 to 20 per cent. ointment with vaseline, lanolin or glycerin, according to Arlt's formula (copper citrate 5-20, and glycerin ointment enough to make 100). (3) In the form of pencils, containing from 10 to 20 per cent. of the active substance in gum Arabic, starch, dextrin, sugar, distilled water, and glycerin to make a mass. (4) In the form of washes, in water, 1-9143. The

author has employed this remedy in fresh trachoma, in pannus tenuis, in pannus crassus, in corneal opacities, and in chronic conjunctivitis. He obtained good results in 62.5 per cent., 35.2 per cent. of the cases giving no results, while in 2.02 per cent. the disease became worse. In 12 cases of fresh trachoma (the word *fresh* meaning trachoma in the earlier stages) 3 were without result, and one got worse after the use of copper citrate pencils. The best and most satisfactory results were obtained in pannus tenuis, in which ointments of from 5 to 20 per cent. of copper citrate in glycerin caused disappearance of the pannus in from one to three days. Photophobia, lacrimation and discharge from the conjunctiva diminish very rapidly under this treatment. In pannus crassus, also, it proved of great value, but not in those cases complicated with xerosis. Trichiasis also interfered with its action, and the lids had to be epilated. In corneal opacities the pencils proved of considerable value, especially in the earlier stages. In fresh trachomata the pencils secured a diminution and even a disappearance of the granulations. In only 12.36 per cent. of all the cases did application of the ointment produce acute exacerbation of the disease, especially in pannus, but this was temporary and was followed by relief. The author concludes that copper citrate is a very valuable remedy in ophthalmic practice. In the rapidity of its effect upon pannus and corneal opacities, it surpasses all other remedies of its class.—New York Medical Journal and Philadelphia Medical Journal.

Purulent Conjunctivitis.—G. C. Savage, in "Southern Pract.," states that conjunctivitis occurring within the first three days after birth should be considered as the result of infection and should be treated as such. Two drops of a two per cent. solution of silver nitrate or of a 10 per cent. solution of protargol should be put in each conjunctival sac. This should be done without waiting for pus formation and repeated on the following day. The silver solution should not be continued unless pus should appear under which circumstances it should be used daily. The eyes should be thoroughly cleansed every half hour with a boric acid solution in order to prevent infection of the deeper layers of cornea.

Every two hours, after cleansing the author recommends that eight or ten drops of the following solution be instilled into each eye.

R Hydrastin sulph.....	gr. ii	12
Tinct. opii.....	m. xx-xxx	1.30-2
Acidi boracici	gr. xv	1
Aq. destil.	℥i	30

M. Sig.: Eight or ten drops to be instilled into each eye every two hours and continued until the eyes are well.

Cold should never be applied to the eyes.—Jour. A. M. A.

“Optometry” in Pennsylvania.—A bill “to define and regulate the practice of optometry in Pennsylvania” is before the Legislature. It should have been entitled “An act to allow opticians to practise medicine and to humbug the public as to diseases of the eye.” Good opticians will have nothing to do with it and do not want their business “defined or regulated” in any such ways; they do not wish to “examine eyes free.” Physicians, of course, are wholly opposed to permitting men ignorant of medicine to treat ocular diseases or to encouraging the dangerous delusion that measuring the eye optometrically or “ophthalmotricianly” has much to do with the treatment of ametropia, heterophoria, or other pathologic conditions of the organ of vision. These facts will of course encourage a certain class of legislators to help the opticians and ophthalmotricians, but they will also encourage sensible men to oppose all such debasement of the practice of medicine.—Amer. Med.

To the Editor of the Annals of Ophthalmology:—May I beg the courtesy of a little space in your forthcoming issue, to correct some errors in the recent notice by your righteously indignant reviewer of the little volume entitled “*Biographic Clinics*”?

1. He makes two mistakes in citing the title of the book—one of them serious, as the volume is not “Bibliographic.” Carelessness and inaccuracy in the use of words so rarely accompanies accuracy and care in logic and the statement of facts, that I feel your precise and just critic should not bear a needless burden. I might also comment upon other words, e. g., “reflexer,” “operable,” “tumorist.”

2. It is said that I “experiment with history,” and that I give “brief sketches of the lives of the 5 great producers of literature.” These are evident slips in statement which so precise a critic should not have made.

3. “The book is written chiefly for the non-professional

reader," and only "between the lines for the practitioner," are further quotations, but against such statements I must protest, as the book was written entirely for practitioners, and published by a firm who publish and deal in medical books only.

4. "Infatuation of the enthusiastic," "revels in dogmatism," "The same same cry of the omniscient I," "illogic energy of the fanatic," "driven by a demon," "infatuation"—such are some of the kind and discriminating expressions used concerning myself. I repeat them only to say that they weaken the reviewer's sound contention, and to regret that in his two pages there seems to me to be a greater use of "the I," and more reprehensible egotism, than in all of my 213 pages. But he is to some extent correct in this charge, and I shall more humbly and solicitously try to avoid these blemishes in future.

5. The first duty of a reviewer is to set before his readers the facts, purport and methods of proof of a book. In the present instance criticism occupies by far the greater part of the review, and so just and judicial is it that it is a pity there was failure to set forth the clinical facts as to De Quincy, Carlyle, etc., and to acknowledge the uncontradicted statement that eyestrain might have caused the symptoms complained of by these men. It is well, of course, to repress the zeal of the dogmatist, fanatic and egotist, and your reviewer's chastened zeal, his well-weighed statements, and his modesty, are most praiseworthy.

6. The genial A. B. H. kindly and graciously hints at a great many of my "infatuations," but I must disclaim certain of them: I never said or implied that he or another was not "honest," that his "experience did not count for anything," that the "rest-cure is not potent," that "Haig is a fool;" that "muscle-cutting is followed by death and destruction;" that "the nasal reflex apostles have no right on their side;" that poor food, poor air and little activity "do not beget headaches and other diseases;" that "they are fools and knaves;" that I do not fail to cure headaches; that there are "other causes than eyestrain of the many complaints of humanity;" that only Philadelphians can correct astigmatism, etc. These and a number of other similar sins gratuitously and erroneously charged up to me are not mine, and your coworker will gladly acknowledge that he did not

mean to charge me with them. They are slight and excusable errors of a wise (and not "horrible"), conservative physician and "tumorist."

7. And the implied dissent of your urbane reviewer will make me henceforth more careful not to say "all oculists," when I should say "all but a select and judicious few." That these few have found that isometropic and nonastigmatic myopia produces headache; that they still believe that eyestrain does not cause constipation, insomnia, sleepiness in reading, etc.; and, by inference, does not, indeed, beget any cerebral or systemic reflexes, whatever,—well, it is pleasing to find such fine modern examples of scientific atavism! And in an oculist!

8. Lastly, I must also dissent from the only remaining item of your reviewer's notice, to which I have heretofore not attended,—his praise of me as a "stylist." He could not have offended me in another matter so gravely. I have a deal of "infatuation," "illogic energy," "fanaticism," "dogmatism" even, and certainly pride, in accurate observance of facts, and in logical conclusions from them; but, as to "style" in literary statement—that is the last thing I should think of or lay claim to!

Respectfully yours,

GEO. M. GOULD.

1631 Locust St., Philadelphia.

May 26, 1903.

International Medical Congress.—The Fourteenth International Medical Congress was held in Madrid, Spain, April 23-30, 1903, in the large Public Library and Museum (Bibliothek y Museo). About 6,000 physicians, mostly from the Latin countries, were in attendance. The meeting opened in almost indescribable confusion, similar to, but surpassing, that of the former "congress" held in Rome, six years before. To American minds, the policy of "manana" seemed to have been followed in most matters, and the poor organization and business methods contributed to make the meeting a stupendous fiasco.

A number of the authors and men whose names were posted for discussion of papers failed to attend the meeting. As the sections met in the halls of the Art Gallery, where crowds were continually passing back and forth, it was with the utmost difficulty that readers or speakers could be heard



PLATE I.—RIGHT EYE

Retinitis Proliferans cum Ablatio Retinae, following
subretinal cysticercus: stage of
terminal reaction.

561

THE ANNALS OF OPHTHALMOLOGY.

VOL. XII.

OCTOBER, 1903.

No. 4.

CLINICAL OBSERVATIONS ON A PROBABLE CASE OF INTRAOCULAR CYSTICERCI OC- CURRING IN BOTH EYES.

BY H. V. WÜRDEMAN, M. D.,

MILWAUKEE.

(Illustrated with 2 Colored Plates and 3 Cuts in Text.)

Aside from the rarity of the affection in America, the following described case of probable cysticerci, occurring in the posterior segments of both eyes possesses certain features and seems to clear up some doubtful points special in the life history of these parasites.

In a somewhat extensive experience of sixteen years special practice I have never seen a case of ocular cysticercus before in America and can remember but two instances of such, observed in 1888-9, during my work in European clinics where the occurrence is more often noted than in this country. But few of our 2500 physicians who are more or less interested in ophthalmology have ever seen such cases anywhere.

July 1, 1903, M. M. R., of Fayetteville, Tenn., native, aet. 24, weight 130 lbs., height 5 ft. 7 in., came to me for examination of his eyes. Family history good; had been in general fair health except for indigestion and occasional muscular rheumatism. One and a half years ago

after ranching in Texas (where the ranch meat is largely salt pork, corned beef and freshly killed beef, all of which is often crudely and insufficiently cooked), he saw "wheels" in front of the right eye and the sight rapidly failed to perception of light. He consulted Dr. L. Keplinger of Wachsahachie, Texas, who wrote in answer to enquiry: "Mr. R. came to my office Sept. 26, 1902. Had



Fig. 1. Visual Field of Left Eye.

severe headache and could not see out of his R. E., V. R. = light, not improved with glasses; L. = 20/LXX with $-2.25 = 20/XX$. The ophthalmoscope showed a well marked case of neuro-retinitis, large pigmented spots in periphery. No detachment of retina or evidence of cysticercus. L. E., fundus presented normal appearance (except myopia as recorded above). I placed him on mixed treatment (although he gave no history of syph.) Gave him galvanic current 3 times a week, positive pole



PLATE II.—LEFT EYE

Cysticercus Cellulosae in Corpus Vitreum; stage of initial reaction:
larva attached by base of cyst to superior nasal branch
of retinal artery; hemorrhage from place
of migration: invasion retinitis.



to R. temple, negative to left. (5 mm. 5 minutes). He gradually improved under this treatment. Headache, ceased. R. E. cleared up, outlines of disc became clear, could count fingers at 4 ft. and L. E. remained normal when discharged." (Personal letter August 31, 1903.) He returned to his home about June 1st, in Nashville, Tenn., and consulted Dr. Geo. C. Savage who under date of July 6, 1903, courteously replied to my letter of enquiry that he "remembered Mr. R's. case of detachment of the retina in the right eye but nothing attracted his



Fig. 2. July 1st, 1903.

attention to the left eye." "At any rate I made no diagnosis of cysticercus." Those who know Dr. Savage's skill as an ophthalmoscopist may be assured that the left eye was then normal.

He consulted Dr. Sydney Walker of Chicago, June 29th, who "informed him and his brother that in the right eye there was almost total detachment of the retina with retinitis. In the left eye I found a cysticercus about 2 1/2 m. m. long in vitreous. It does not appear attached to retina to me. I have seen it change its location several times." (Personal letter dated July 6, 1903.)

July 1, 1903, he came to me and gave the above history (except the information as gained above directly from Drs. Keplinger, Savage and Walker), and in addition complained of headaches and vertigo, together with peculiar subjective sensations in the left eye, similar to those which he had first experienced 1 1/2 years before in the right. He thought he could "feel something moving in the left eye," saw floating specks and the "wheels" above referred to were constant, especially being aggravated by a bright light.

General Physical Examination showed heart, lungs, liver and other abdominal and thoracic viscera apparently normal; urine normal, blood not examined; cerebation good. The interest centered upon examination of the eyes which revealed the following most remarkable conditions:—

Examination of the Eyes and Vision:

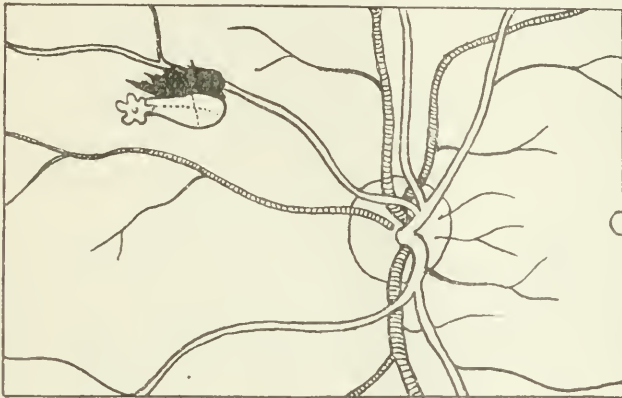
Right Eye: External appearances normal; Vision = light perception down and out, with small infero-temporal candle field of vision. Pupillary action to accommodation, but to light only from down and out or consensually.

Ophthalmoscopic appearances: Detachment of the lower half or more of the retina, which was thrown in three folds, the most anterior of which was the nasal one, which could be focussed with + 8.0 D. The chorioidal glare could be made out through much of the detachment. (See Plate I). In the upper portion of the fundus the red reflex with some of the retinal vessels could be seen distinctly without a lens; over the nerve head and apparently springing from it, projecting into the vitreous 6 to 8 D., was a membranous opacity with large sized, new formed vessels upon and in it which were apparently arterial in type. The body of the vitreous seemed clear. This condition, as is shown by Plate I, is the picture of Retinitis Proliferans. This vitreous opacity could be observed over a portion of the retinal detachment, but this depended upon the point of view, there being a decided parallax between the depths of the fundus, the detached retina and the organized exudate. The colored plate was completed subsequent to the patient's departure, from a pencil

sketch made at several examinations, but is believed to be fairly accurate. It is a marked example of Retinitis Proliferans cum Ablatio Retinae.

Left Eye: External appearances normal; Vision, = 6/XVIII, with $-0.25 \text{ C} - 0.25, 180^\circ = 6/\text{VI}$. Visual Field; (See Fig. (1), good size for form and colors; a small scotoma for black or red dot at 300° (down and out) 10° from fixation point. Pupillary reaction normal.

Ophthalmoscopic Appearances: Fundus generally normal with exception of upper nasal quadrant where the vitreous was slightly opaque in spots and the retina



Eig. 3. July 5th, 1903.

clouded. On following out the 2nd temporal artery above, which was darker in color than the other branches, a bottle-shaped cyst, of the apparent length of 2 to 4 millimeters (on the several observations), with its base attached to a hemorrhage of the artery, was observed. This was whitish and translucent and had a peculiar reddish cross-marking on the body. The head was free in the vitreous and apparently had six hooklets. (See Plate II made during four observations by me directly from the patient, which is most accurately drawn both as to exactness of vessels and color of the parasite and of the retinal and vitreous disturbances.) I am sure there were dis-

tinct movements of the head, aside from a general quivering, which were especially elicited by rapid movements of the eye, and more by the light of the electric ophthalmoscope than by the gas burner and ordinary ophthalmoscope. These appearances were corroborated by my associate Dr. Nelson M. Black and by Dr. Charles Zimmerman whom I called in consultation. (See also above excerpts from letter of Dr. Sydney Walker. Two outline sketches are here reproduced (see figs 2 and 3) which show somewhat different positions of the parasite on two observations.

The body of the cyst did not have the reddish glare usually noted in descriptions of cysticercus in the vitreous and it was also smaller in proportion to the head and stalk, which were more developed. The appearances above noted led me to make the diagnosis of Recently Migrated *Cysticercus Cellulosae* in the Vitreous. Plate II. clearly shows that the parasite bored through the branch of the retinal artery and did not get into the posterior segment of the eye by means of the chorioidal vessels.

The results to the patient of the examination were clearly limited to establishing a diagnosis; the prognosis given was the hope that the parasite would die and become quiescent before inflammatory processes ensued which would cause loss of function as in the other eye, which had probably passed through the same process, beginning with migration of a cysticercus through the retinal circulation into the posterior segment, which later passed through the stage of indolence to that of terminal reaction with resultant death of the larva before sufficient inflammation occurred to cause panophthalmitis.

The patient was advised to refrain from use of eyes in reading, to avoid severe physical efforts on account of possibility of retinal detachment and to go under Dr. Sydney Walker's care in Chicago, as he expected to live there for several months.

In Saltzman's article on the Entozoa of the Human Eye which I translated and published in Norris and Oliver's System of Diseases of the Eye, Vol. IV, p. 846, which is the most exhaustive treatise on the subject at my command, it is stated that:—

“The invasion may occur through the chorioidal vessels

or through those of the retina; the first way is certainly the more frequent. Invasion by way of the retinal vessels is conceded by some authors to be possible though a rare occurrence; and by others as lately by von Graefe, it is denied." "There are, however capillaries in the chorioid wide enough (0.036 millimetre), to allow the passage of the embryo. Still it may get into comparatively narrow vessels, as the following shows. The arteria centralis retinae is 0.2 millimetres at its narrowest point before it enters the lamina cribrosa; its diameter is therefore at least seven times greater than that of the embryo (maximum 0.028). Consequently it can not be conceded that the embryo will produce phenomena of embolism of a principal vessel on entering the retinal vascular system, as has been supposed by several observers. It would be more likely to lodge in one of the smaller vascular twigs, producing branch embolism with but slight functional disturbance. The embryo is swept more frequently into the posterior ciliary arteries. * * *

"although the cysticercus is often found in numbers in the skin and brain, in the eye it is almost always solitary. In only a few cases have two cysticerci been found in one eye (Kauweki, under the conjunctiva; Becker, Gradenigo, Cohn and A. v. Graefe, in the posterior segment); Schöbl, three encapsulated; Simultaneous occurrence of cysticerci in eye and skin (Schultz, Hirschberg); or brain (v. Graefe, Hock, Sasson, Acalai)."

No case is known to have developed cysticerci in both eyes except the one whose history is herewith submitted.

This case presents the three characteristic periods: In the left eye; (1) the *initial reaction or invasion inflammation*, evinced by the hemorrhage, arterial stasis, the retinitis and disturbances in the vitreous, which are said to be transient and which already are passing into (2) the *stage of indolence*, in which the movements of the parasite are less, but it thrives and grows, after some weeks or months passing into (3) the *stage of terminal reaction*, as is well shown in the right eye, which in time leads to destruction of the parasite and loss of sight; if in posterior segment from proliferating retinitis or detachment of the retina, if anteriorly from uveitis or even panophthalmi-

tis as the growth of the embryo is sometimes attended by the formation of pus.

The *prognosis* depends upon the location of the intruding organism; if under the conjunctiva or extraocular the patient usually appears with a cyst which may be opened and the contents evacuated with safety; if within the anterior chamber it may be extracted by corneal section; but, if the growth be within the posterior segment nothing can be done except palliative and expectant treatment in the hopes that the worm will die before sufficient reactionary inflammation occurs to produce opacities of the media, detachment of the retina or other destruction of tissues leading to disorganization.

In our case a cysticercus has produced loss of function in the right eye and is probably dead. Another cysticercus has entered the vitreous through the retinal circulation in the left eye and may ultimately cause a similar loss of function on the side which may later be duly chronicled by some other writer as the patient has passed out of my observation.

September 1, 1903. 105 Grand Avenue.

THE SO-CALLED MYDRIATICS: THEIR ACTIONS, THEIR USES AND THEIR DANGERS IN OPHTHALMOLOGY.*

BY CHARLES A. OLIVER, A. M., M. D.,

PHILADELPHIA, U. S. A.

The drugs spoken of as "mydriatics" are ophthalmologically divisible into four classes—analgesics, mydriatics, iridoplegics, and cycloplegics. They receive their generic name from the most prominent objective sign that is produced by their action. By reason of their many-sided effects, they are the most valuable diagnostic and therapeutic agents which are employed in ophthalmic practice; the effect being mainly dependent upon varying grades of true peripheral palsy.

They act locally: This has been proven by the application of mydriatic-containing aqueous humors to other eyes, and by the action of the drugs after excision of the heart, after decapitation, and after isolation of the eyeball. Further proof of their local actions is shown by their increased activity after removal of the external layers of the cornea. Moreover, local applications never affect the fellow organ in a similar way.

Most prominent among the mydriatics are: holocain, cocaine, eucain, euphthalmin, homatropin, mydrin, atropin,

*The first part of this paper, with that portion which relates to "mydriatics" alone, appeared in the *Journal of the American Medical Association* for February 21, 1903, as an abstract communication of a paper which was read by the writer before the Section on Materia Medica and Therapeutics at the June, 1902, meeting of the American Medical Association. The abstract of this paper appeared in the *ANNALS* April, 1903, p. 325. The present article is the original paper in full with many additions, which from time to time have been employed by the writer during a course of lectures given to a class of private students during the Fall and Winter of 1902 and 1903.

scopolamin, daturin hyoscyamin, hyoscin, and duboisin.* As is well known, many of these alkaloids, although of but one or two elemental atoms difference each, or even when absolutely isomeric, have quite variable physiologic actions upon one and the same series of ocular structures. So too, with the supposedly identical alkaloids derived from the same genus of plants grown in various countries, under varying conditions, or when obtained from one and the same plant at different ages. These peculiarities of action are probably dependent upon idiosyncrasies of molecular arrangement of the same number of contained elements, the relative optimal and subinvolutional conditions of the contained cellform, and the variability of the ocular structures.

The only true method of differentiating these effects and grading the relative degrees of therapeutic usefulness of the drugs is to study their comparative powers upon the excessively rare normal emmetropic eye or upon the carefully corrected and healthy ametropic organ: a plan which gives a series of known factors upon which to base desired effects upon irritated, inflamed, and at times, weakened tissues.†

The chief effects of this class of therapeutic agents upon the eye consist in external and internal analgesias, combined with local paralyses of the sphincter muscles of the iris and ciliary body. By some observers, most of the drugs (particularly atropin, daturin, scopolamin, hyoscyamin, and duboisin), are supposed to exert simultaneous excitatory actions upon the radiary fibres of the iris and the ciliary

*Several other less frequently employed alkaloids, delphinin, solanin, etc., are not considered here. A number of experiments with the biborate and salicylate of solanin have been conducted by the writer, but the results are reserved for a paper upon another subject. The writer has not considered drugs, such as gelseminin, coninin, aconitin, which produce local effects upon the eyeball and their related structures by ingestion and topical application elsewhere, even when they are thus intended: for example, the internal administration of hyoscyamin for spastic conditions of the interior and exterior ocular muscles. Such drugs as strychnin and curare also have not been considered.

†In the tests which have been conducted by the writer similar conditions in regard to illumination, time of day, condition of eyes, form of apparatus, and choice and use of drugs have been maintained.

body. Some of the drugs are said to contract the blood-vessels, and to act upon the peripheral ends of the nerves. A number of authorities believe that cocain—holocain—and eucain-mydriases are due to local irritation of the sympathetic nerve endings in the iris (both vaso-constrictor and pupil-inhibitory fibres).

The local effects of the drugs are increased by bodily rest, with nonusage and nonexposure of the ocular organs. Cold applications diminish both the primary and secondary actions of the drugs. Heat tends to promote both of these results.

While the drugs are in use, colored glasses—preferably smoke tinted coquilles which are free from blemishes and optical imperfections, should be worn. The degree of tinting should be regulated by the feelings of the patient and the conditions of the case. All of the solutions should be freshly prepared in small quantities, made neutral, and kept only for brief periods of time. Some ophthalmologists prefer to add boric acid or some preservative to the solutions, but this is not necessary, if the above rules are followed. During the instillation of the drugs, care should be taken to prevent their passage into the lacrymal and the nasal passages.

ANALGESICS.

As analgesia constitutes one of the forms of action of a number of the drugs which are used for mydriasis, a brief consideration of them in this respect is herewith incorporated in order to make the subject-matter as complete as possible. The most prominent drugs in this series are holocain, cocain, and eucain—they being here considered in the order of their comparative values as such.

HOLOCAIN (also known as amidin) is a synthetic preparation, a derivative of paraphenetidin. In hydrochlorate form, it is used as an analgesic in one-per-cent strength solutions which are about equal in power to five-per-cent strength solutions of cocain. When the drug is first dropped upon the conjunctival sac it produces a sensation of smarting for about thirty seconds' time. Sufficient analgesia for the commencement of operative procedure is obtained in less than two minutes' time the local affect lasting, for

some fifteen to twenty minutes. The drug is particularly valuable for operations upon the tissues of the iris. It is generally supposed not to have any effect upon intraocular tension.

It is quite prompt and penetrating. It is said to possess but feeble iridoplegic powers, and but little, if any, at times, cycloplegic properties. Unlike cocaine, it does not effect the corneal epithelium. Dropped upon the conjunctival membrane it does not give rise to any general disturbance. It has been found to be somewhat useful as a mydriatic when it has been combined with some of the iridoplegics. It is quite stable, and is reported to be antiseptic, possessing inhibitive influences upon bacterial growth, killing pus organisms, and acting as a protoplasmic poison.

COCAINE, from *erythroxylon coca*, is principally used in the form of the hydrochlorate as an analgesic, but it may be employed as an evanescent mydriatic for diagnostic purposes. Four drops of a two-per-cent strength solution at first give rise to a slight smarting sensation lasting for one or two minutes' time. Analgesia, continuing from four to six minutes, rapidly ensues, and is complete in four to six minutes' time. Associated with this is a contraction of the conjunctival bloodvessels, a whitening of the sclera, a partial dilation of the pupil, a slight weakening of the power of accommodation, and a broadening of the palpebral fissure. The mydriasis, which reaches its utmost in about thirty-five to forty-five minutes, is apt to persist for ten to twelve hours' time. One or two drops of a four-per-cent strength solution give partial dilation of the pupil with a slight paresis of the ciliary muscle in twenty minutes' time.

Its effect being purely local, it is useless unless it is applied directly to the part. To reach the internal structures of the eyeball it may be repeatedly employed in very strong solutions in order that it may so saturate the aqueous humor as to act directly upon the contiguous intraocular tissues. (This plan has been abandoned by the writer, who has learned to more easily and more effectively accomplish the same purpose by injecting a few drops of a two-per-cent strength solution directly into or upon a denuded or exposed part: for instance, into the

anterior chamber after the completion of a corneal section; upon the open surface of the interior of a meibomian cyst; and directly upon the tendinous, muscular, and subconjunctival tissues through a conjunctival incision.)

At times, the drug will be found useful to facilitate the absorption of other mydriatics, preventing conjunctival irritation, lessening lacrymal secretion, and giving additional dilation of a pupil even when the pupil seems to have been fully enlarged by one of the most powerful mydriatics. The drug is said to rapidly dilate the pupil of reflex iridoplegia.

All solutions of the drug should be made with boiled sterile water, prepared afresh, and kept in small quantities. It may be employed in oily menstrua, gelatine discs, etc., but such methods are too slow for most analgesic purposes and render the drugged structures bacteriologically uncertain.* Hypodermatic injections of cocain for the removal of growths, etc., cannot be recommended, as the primary procedure employed for placing the analgesic material in position, is oftentimes as painful and as disturbing as the intended operation itself.

Eucaïn, in the forms, hydrochlorate Alpha and Beta, are, particularly the latter, used for local anesthesia. As a rule, in five-per-cent strength solutions,† they exercise but little if any, action upon the iris and ciliary body muscles. They are not very poisonous, and can be used hypodermatically with safety. When first applied they produce conjunctival irritation.

MYDRIATICS.

The drugs which are employed for the definite and determinate purpose of pure mydriasis in ophthalmology are comparatively few. In the writer's hands they are limited in the order of their relative values to the following:

*Vide infra.

†Tropacocain from a Java coca plant, which chemically is a benzo-pseudo-tropaine, is used in three-per-cent strength solutions as an analgesic. It is said to be quicker and more lasting than cocain. Both pupillary enlargement, which is said to be less than it is with cocain, and accommodative loss, appear during its employment.

euphthalmin, homatropin, mydrin, and ephedrin. Used in the strict sense of the term, they serve an important purpose by permitting a broader view of the interior of the eye.

EUPHTHALMIN is usually employed in the form of the hydrochlorate. Two drops of a five-per-cent strength solution produce almost a maximal mydriasis, which lasts some two or three hours, and which is maintained under strong light-stimuli; the pupil returning to its normal size in from twenty to twenty-two hours' time. The action of the drug upon the ciliary muscle is very slight, a similar amount of the same strength solution evidencing its primary weakening influences upon the power of accommodation in from ten to fifteen minutes' time; the maximum effect being reached in sixty to eighty minutes; and the last remnants of action not ceasing until from five to seven hours have elapsed.

Used properly the drug is the best agent which we possess for pupillary dilation for ophthalmoscopic diagnosis. It is more powerful than mydrin. It is slower than homatropin in its action, yet its effects pass away more quickly; and it neither degenerates the corneal epithelium, nor possesses any irritative or general intoxicant effects.*

HOMATROPIN, a mandelic ether of tropin, is generally used in the form of the hydrobromate. It is prepared synthetically. In two per cent. strength solutions it is used as a mydriatic. (In greater strengths, or by repeated instillations, it is employed by many as a cycloplegic for the estimation of refraction. For this purpose, many ophthalmologists instil two drops of a one to four-per-cent. strength solution into the conjunctival sac every five or ten minutes until three or four instillations have been made, examining the eye for lenses in thirty minutes' time after the last instillation. These strengths of the drug employed in this manner, will produce palsy of the ciliary muscle which will last at least sixty to ninety minutes; recovery usually taking place in about forty-eight hours' time.)

For mydriatic purposes, one drop of a one-to-five-hundred strength solution instilled into the conjunctival

*The writer has never seen any glaucomatic symptoms produced by its use.

sac every five minutes until five instillations have been made, will produce a maximum effect of dilation upon the pupillary area in from three quarters of an hour to an hours time—the pupil commencing to dilate in from six to fifteen minutes, and returning to its normal size in about fourteen to eighteen hours' time.

(Its effect upon the iris and the ciliary muscle, is increased by the addition of cocain. This can be accomplished by placing one-fiftieth of a grain each of the two drugs in discs which are allowed slowly to melt upon the conjunctival surface, and from thence to be absorbed into the interior of the organ. Oleaginous menstrua and oily excipients hold the drug in position for a longer time, and thus increase the amount which is absorbed into the interior of the eyeball.)

In some cases, the mydriasis produced by this drug will partially disappear temporarily when the subject is placed under the influence of a general anesthetic.

MYDRIN is an artificial preparation composed of one part of homatropin hydrochlorate to one hundred parts of ephedrin in a ten-per-cent. strength aqueous solution. Applied to the conjunctiva the pupil begins to enlarge in from six to ten minutes' time, dilating to a maximal size of some four to seven millimeters, in about thirty to thirty-five minutes. Twenty to twenty-five minutes later, the enlarged pupil begins slowly to diminish in area, until, in from four to six-hours' time, all artificial mydriasis has disappeared. This mixture is much more effective as a mydriatic agent than either of its constituents in their uncombined proportions. Powerful light-stimuli, forced accommodation, and strong convergence impulses, either exerted separately or in association, will give rise to iris-play with slight pupillary contraction. (The belief that the drug does not exert any parietic action upon the ciliary muscle is untrue. Repeated experiments in regard to this question by the writer have conclusively shown the loss of one and even of two diopters of accommodative power gradually taking place in about eighteen to twenty-minutes, and passing away slowly in from six to eight hours time.)

Such a drug therefore, is useful for mydriasis of brief duration, rendering it valuable as an adjuvant for diagnostic purposes.

EPHEDRIN is an alkaloid which is derived from *Ephedra Vulgaris*. One or two drops of a two-per-cent strength solution will give rise to almost complete mydriasis, in an unirritated and healthy eye, in about fifty minutes' time. (The action upon the iris can be noticed in about eight minutes, and lasts for eleven or twelve-hours. There is a very slight effect upon the ciliary muscle, and as a rule, there is not any increase of intraocular tension.)

The writer has successfully and usefully employed this drug in weak solutions for partial pupillary dilation for diagnostic purposes. In a series of unpublished experiments with single instillations of the one-hundred-and-twentieth, the one-sixtieth, the one-ortyeth, the one-thirtieth, the one-fifteenth, the one-tenth, and the one-fifth of a grain of the hydrochlorate salt, he has found both corneal and conjunctival analgesia preceded by slight hyperemia with the stronger percentages; and irregular pupillary dilation (from four to five millimeters with the weaker strengths, and from seven to eight millimeters with the stronger ones):—all appearing in ten to fifteen minutes and lasting from twenty to thirty hours. (With most of these amounts there were a series of definite recessions of the near-point, these being obtained at periods averaging from thirty to forty minutes after the use of the drug.) No general symptoms, except an increase of the pulse rate in a few instances, and a slight frontal headache in a case or two, could be noticed.

In combination with homatropin the drug acts more rapidly and with increased energy.

IRIDOPLEGICS.

The completed form of action of such drugs upon the iris is not only expressed by full mydriasis, but by a fixity of the iris tissues. To be certain of this, it is best to depend upon the tests for absolute cycloplegia, for if total ciliary paralysis be found, it may be safely assumed that complete iridoplegia has taken place.

During the paralyzant act, some interesting phenomena take place; objects appear more strongly illuminated than ordinary; the pupil of an untouched fellow eye becomes smaller than normal in the beginning (provided that con-

sensual reflex action to light-stimuli is intact); the pupil of the drugged eye will become primarily smaller for a few moments time, if there be any conjunctival hyperemia or an apparent more deeply seated irritation;* and the pupil of paralytic miosis becomes at best but partially dilated.

ATROPIN, an alkaloid from *Atropa Belladonna*, is most frequently employed in the form of a sulphate or a salicylate.†

In the one-fortieth and the one-twentieth of a grain strengths, its action upon the iris of an emmetropic or a carefully corrected and normal ametropic eye, first manifests itself by an one-a-half-millimeters increase in pupillary size in four minutes' time. Full pupillary dilation appears in twenty-one and sixteen minutes respectively after the instillation of the two strengths of the drug; this dilation remaining stationery for from twenty-six to thirty hours, and the pupil returning to normal in about eight to ten days' time.‡

Atropin is a drug which the writer has no hesitancy, under proper precautions, in allowing the patient to use for himself.§

SCOPOLAMIN, the alkaloid obtained from *Scopolia Atropo-*

*This the writer has seen at times with the use of both, homatropin and hyosein.

†Though the salicylate salt is said to be the better, yet based upon a number of experiments with it and the sulphate, the writer has not found anything to bias him in its favor. With the so called nitro-atropin he has never had any experience.

‡Vide the American Journal of the Medical Sciences, July, 1881. In dogs and cats the actions are similar to those seen in man. They, as Snellen in his article on "Mydriatics and Miotics" in the second volume of Norris and Oliver's "System of Diseases of the Eye" says, are much "less marked in rabbits, very slight in birds, just perceptible in frogs, and scarcely or not at all noticeable in fishes". In partial confirmation of this statement, the writer has for some months been studying a series of anatomical specimens of a great number of eyes of the lower forms of animals.

§The surgeon may permit patients to use daturin at their homes. The stronger drugs he should never allow out of his office and clinic rooms, reserving their employment for himself or competent assistants. For other reasons, the weaker drugs should also be personally employed by him.

ides is an useful iridoplegic. As shown by the writer* the mydriasis of a single instillation of the one-four-hundred-and-eightieth of a grain of the drug into an emmetropic or a normal ametropic eye is obtained in eighteen minutes' time, the dilation of the pupil remaining *ad maximum* for from twenty-four to thirty hours' time, and the diameter of the pupil becoming normal in about seventy-two hours.

At the begining of a few of the examinations made by the writer there was a slight sense of conjunctival astringency which at times amounted to a stinging sensation.

The immediate effects of the drug upon the iris tissue are much more rapid than those which are obtained from atropin (in fact, five times stronger). Recovery from its effects is from two-and-a-half to three times more rapid than it is from those which are produced by atropin.

By some authorities it is stated that the hydrobromate is a mixture of the two bases hyoscin and atropin. In partial controversion of this, the writer has frequently instilled these two drugs coetaneously and has not found either the local or the general results the same as those obtained by the use of the hydrobromate salt of scopolamin alone. Others assert that the drug is nothing else than hyoscin; its physiologic local action however,† is different both in relative degrees and duration.

The hydrochlorate may be used in preference to the hydrobromate, in equivalent doses, as the former salt does not produce any of the unpleasant general symptoms which at times are noticed with the latter one.‡

Employed in the strength of one-four-hundred-and-eightieth of a grain, it shows its effects upon the iris muscle as early as two minutes after instillation, one-half millimeter of increase of mydriasis having taken place by that time.

The drug is better borne by the conjunctiva than atropin, and unlike homatropin, has not, in dosages of useful

*The American Journal of the Medical Sciences, September, 1896.

†The American Journal of the Medical Sciences, November, 1896.

‡See previous note as to the identity of hydrobromate of scopolamin and hyoscin.

strengths, any deleterious effects upon the uveal tract.

DATURIN is an alkaloid of the thorn-apple which is obtained from the seeds of the *Datura Stramonium*. It is ordinarily employed in the form of the sulphate. Although it is considered isomeric with atropin, yet a difference in the physiologic properties of the two drugs has been found by the writer,* who has had the opportunity of making some scientific tests as to its behavior upon a number of young emmetropes and corrected ametropes. With the one-fortieth of a grain, while the pupillary area may not change from a normal three-and-a-half-millimeters for eight minutes time; it may give a sudden jump to six millimeters in size in two minutes more; rapidly and steadily enlarging, until at the end of sixteen minutes, full mydriasis usually is reached.

With a single instillation of the one-twentieth of a grain of the drug, the pupil begins to dilate almost instantly, until at the end of twelve minutes, full dilation, to remain *ad maximum* for from twenty to twenty-four hours' time, is reached. The pupil becomes normal in about fifteen days after the use of one-fortieth of a grain, and in about sixteen to seventeen days after the employment of the one-twentieth of a grain.

A sense of conjunctival astringency, which in a few instances amounts to an actual smarting at times, is found.

HYOSCYAMIN, from *Hyoscyamus Niger*, is employed both in crystalline and amorphous forms, the former being the more powerful, and the more certain in its action. The one-fortieth of a grain of the crystalline form of the sulphate produces full mydriasis in eight to ten minutes' time; the one-twentieth of a grain gives rise to a similar condition in ten minutes' time.† With the smaller amount of the drug this dilation remains intact for thirty-six hours, and the pupil returns to normal in about eight days; while with the greater amount, full dilation continues for forty hours and the pupil does not become normal until about eleven days have elapsed.‡

*The American Journal of the Medical Sciences, July, 1882.

†The American Journal of the Medical Sciences, July, 1882.

‡At times, very curious though not altogether unexpected results were obtained. During a recent series of experiments it was found that although most of the equations remained as before, a number of pupils, especially those of irritated eyes, returned to normal more quickly than did the power of accommodation.

It is an excellent drug for iridoplegic purposes, though at times it seems somewhat uncertain in its effects; possibly not so much due to variations in the action of the drug itself as to an interassociation of impurities, and the substitution of other mydriatics. Especially is this true of the amorphous form of the material.

HYOSCIN is derived from hyoscyamine. Although this drug is said to be isomeric with atropin and hyoscyamin, yet it possesses physiologic properties which are different from those of either of these alkaloids. Both the hydrochlorate and the hydrobromate salts are employed. Of the two the former is the preferable—not only is its quality more certain, but also is its action both sure and distinctive.

The hydriodate salt has been used with safety in one-tenth per cent. strength solution.

Two drops of the one per cent. strength solution of the hydrochlorate salt will act upon the iris muscle of a normal eye almost immediately, producing full mydriasis in about sixteen minutes' time. Its action is very precipitate and irregular, the pupil dilating *ad maximum* with the one-hundred-and-twentieth, the one-sixtieth and the one-fortieth of a grain each of the hydrobromate salt, in fourteen, twelve, and ten minutes respectively, returning to normal in from three to four days' time.

As the drug is a rapid and dangerous intoxicant it must be instilled carefully and in small quantities.*

DUBOISIN is an alkaloid of (*duboisia hopwoodii* or pituri plant of New South Wales and Queensland, and the stronger *duboisia myoporoides* of East Australia and "New Caledonia"). The salt that is usually employed is the sulphate, though the hydrochlorate is also used.

When the drug is placed upon a healthy and properly corrected ametropic eye in the strength of one-hundred-and-twentieth of a grain, in four minutes time the pupil will commence to dilate by a series of irregular jerks—reaching a maximal dilation in from twelve to fourteen minutes. The dilation fully subsides about the ninth or tenth day.

The drug does not seem to produce conjunctival irritation.

*The writer has never had any trouble with it in one per cent. strength solution.

CYCLOPLEGICS.*

Cycloplegia or total paralysis of accommodation is the most difficult end for this class of drugs to attain, and the ciliary muscle returns to its full functioning power only upon the disappearance of the last vestige of the action of the drug. To be certain of ciliary muscle palsy, the accommodative power must be repeatedly tried by the most certain of ophthalmic tests. The degree of refraction, the condition of the intraocular media, the state of the uveal tract, and the functioning power of the retina, the optic nerve, and the intracranial portion of the visual apparatus, must be understood as well as is possible in each individual case, before any positive statement of full palsy can be made. Full mydriasis is an inefficient guide.†

The distant and near visions of all hypermetropes, astigmatics, and low grade myopes are decidedly effected; the middle grades of the first two classes being greatly disturbed. Middle and high grade myopes, particularly the latter, are but slightly if at all inconvenienced.

The necessary qualifications of these drugs when they are to be employed for refraction purposes are that they must be sure; that their action must be prompt and of brief duration; and that they shall be safe, both locally and generally. These requirements are best fulfilled by scopolamin, atropin, daturin, hyoscyamin, hyoscin, and duboisin in the order named. In older subjects, in whom the power of accommodation is markedly deficient, full reliance may be placed upon weaker solutions of same drugs: strengths that can be gauged for any particular case. In the aged, all cycloplegic agents may be dispensed with, but all measurements—both objective and

*For an additional brief description of cycloplegia and cycloplegics in the correction of errors of refraction see page 454 of the fourth volume of Norris and Oliver's *System of Diseases of the Eye*, in the article on "Ametropia; Its Etiology, Course and Treatment."

†In regard to this point, see papers on "The Clinical Value of Repeated Careful Correction of Manifest Refractive Error in Plastic Iritis" and "Some Additional Studies upon the Clinical Value of Repeated Careful Correction of Manifest Refractive Error in Plastic Iritis," published in the 1892 and 1894, "Transactions of the American Ophthalmological Society."

subjective—must be repeated sufficiently often (as in all refraction work) to insure accuracy.

For the temporary indirect and reflex influences upon the exterior muscles of the eyes, effects which so often become necessary in the various kinds of heterophoria and heterotropia, particularly in those forms which are in association with third nerve excitation; atropin, daturin, scopolamin, and hyoscyamin are the most suitable drugs. A system of graded therapy must be employed. For this purpose the most certain, the most lasting, and the least dangerous of the drugs should be used. It is the gradual curbing of an undue physiologic force by a series of temporary rests which renders such therapeutic agents effective and useful: it is the converting of the undue equilibrium tendencies of the two visual organs during their combined functioning into partially independent actions;—thus in a measure removing a too great physiologic strain, and allowing the entire series of ocular muscles to fall into their true anatomical relationships. For these purposes, some cases—particularly of alternating type—demand the use of the drugs in both eyes: in others, in which a convergence, for example, remains fixed, the use of the drug in the fixing organ is preferable, no matter whether or not it be physically the better eye.* Correction of refractive errors is necessary in all cases.

For spasm of accommodation, the best results are obtained by employing scopolamin instead of atropin every third time, gradually working partially correcting lenses before the eyes, and thus preserving what has been gained, until at last, as much of the total error of refraction is obtained as might be considered commensurate with the age of the patient. These lenses are then given for more or less permanent use.

Atropin and daturin, by reason of their steady reactions and long continued serviceability, are preferable to other drugs in cases of retino-uveal irritation. Scopolamin offers itself as a useful agent to begin such a form of therapeutic action, while the other two drugs are valuable

*Here there is a double object—the removal of undue muscular tendencies from both eyes, particularly, and the compulsion of the usually employed organ to a greater degree of functioning.

in maintaining any good results which have been obtained.

In cases of inflammatory diseases of the retina and chorioid, atropin and daturin are the best agents to set the ciliary muscle at rest, in order that it may cease to drag upon the chorioidal and retinal membranes; hyoscyamin is useful at times. The action of the drugs must be unspasmodically prompt, quietly powerful, and gently lasting.

Anterior uveal inflammation—that is inflammation in the iris and ciliary body—when at all gross, presents three factors which are detrimental to the usefulness of all of the cycloplegics: (1), as a rule, the corneal channels are so infiltrated that they will not permit the entrance of the drugs through them; (2), the specific gravity of the aqueous humor is so altered and the lymph-stream circulation so blocked, that proper endosmosis fails to take place; (3), the inflamed tissues are so congested and rigid that the drugs cannot act energetically upon them.

In such cases, scopolamin, preceded by hot stupes, rapidly followed by atropin, daturin, or hyoscyamin, will, in the great majority of cases, bring about the results of rest and extrusion of lymph and blood from the parts in one or more sittings. In some instances, in which this plan of therapy is not rapid enough, sufficient portions of the stretched, taut, and oftentimes nonpermeable epithelial covering of the cornea can be desquamated by one or more instillations of strong percentages of cocain, so as to expedite the entrance of the drugs. This latter procedure should never be attempted if there is any question of introduction of germ-life into the interior of the organ; this however is not apt to take place except in broken down subjects with germ-bearing tissues of non-recuperative type; possibly upon account of an existing leucocytosis.

So little of the drug is absorbed in these cases that large quantities of the solutions following one another rapidly at brief intervals, may be employed with impunity provided that due care is exercised to keep the excretory portions of the lacrymal passages closed, and that there are not any breaks or denudations in the tissues which lead directly into the general lymph and vascular circulations;

no practical amount of intraocular osmosis of the drugs ever giving rise to gross toxic symptoms.

Micropsia is a common symptom reported by patients who are observant. It is dependent upon the disturbed interrelationships between the accommodative and convergent powers, and is said to be the most noticeable, though not so great, during the return of muscular power.

In protracted and chronic cases of iritis and iridocyclitis* it is best to alternate the various iridoplegies and cycloplegies.

SCOPOLAMIN, the alkaloid mentioned among the iridoplegies, is a drug upon which, when used in proper quantity, the utmost dependence for refraction-work may be placed. Based upon a series of experiments, the writer† has come to the following conclusions: 1, The early and complete paralysis of the ciliary muscle which may be obtained by the instillation of the one-four-hundred-and-eightieth of a grain of the drug, and the rapid and full return of the action of the muscle, render the drug in this amount the most efficient and the most valuable cycloplegic for the proper determination of the total amount of ametropia; 2. The comparatively rapid return from the full dilation of the pupil produced by this amount of drug to normal pupillary width, renders the drug in this strength, less objectionable than those which by reason of the greater strengths necessary to permit proper cycloplegic work, must be employed in amounts which give more permanent mydriasis; and 3. The freedom from injurious constitutional effects when this amount of the drug is used, renders this dosage safe for employment in all cases in which total cycloplegia becomes necessary.

The drug produces a loss of two diopters of accommodative power in two minutes' time, and there is a total ciliary paralysis in twenty-three minutes: The total paralysis is maintained for from twenty-four to thirty-six

*It will be noticed that the main action of the drugs upon so-called iritis is placed under the section on cycloplegies: this has been done intentionally, because almost unexceptionally, there is a combined cyclitis: the ciliary body involvement in this particular class of subjects being the more important.

†The American Journal of the Medical Sciences, September, 1896.

hours, and perfect reestablishment of the power of the muscle takes place in about ninety-six hours time.*

ATROPIN, in the strength of the one-fortieth and the one-twentieth of a grain is one of the **most** reliable drugs in its action upon the ciliary muscle of an emmetropic or properly corrected and normal ametropic eye. Its first manifestation is upon the ciliary muscle, this being shown by a loss of one-and-one-half diopeters' strength of accommodative power in two minutes time.

Complete ciliary palsy passing through a series of uniform losses, is reached in thirty-eight and forty-six minutes respectively with the greater and the lesser amount of the drug. This paralysis of the ciliary muscle remains intact for from about thirty to forty hours. The muscle returns to normal in from eleven to fourteen days' time†.

DATURIN, in the one-fortieth and the one-twentieth of a grain strengths when instilled into either an emmetropic or a healthy ametropic eye causes the ciliary muscle quickly to lose two, and three-and-a-third diopeters' power, respectively, in two minutes' time, the muscle steadily becoming more and more paretic until complete paralysis is reached in thirty-six and twenty-six minutes' time. This ciliary paralysis remains intact for from twenty-four to thirty-six hours, with the former amount of the drug, full accommodation returns in nine days' time: with the latter, it returns in ten days' time.

HYOSCYAMIN, in the one-fortieth and the one-twentieth of a grain each of the crystalline sulphate, when instilled into an emmetropic or a properly corrected ametropic eye, will fully paralyze accommodation in thirty and twenty minutes respectively.‡

Total ciliary paralysis remains intact for forty to forty-eight hours. Full accommodation is regained in from eleven to twelve hours time.

The drug is a most powerful cycloplegic for use in obtaining rest in all grades of uveal irritation and inflam-

*Certainty as to the identity of atropin and I—Scopolamin is still forthcoming.

†Vide The American Journal of the Medical Sciences, July, 1882.

‡The American Journal of the Medical Sciences, July, 1882.

mation, from the slightest ametropic forms to the gravest dyscrasic types.

HYOSCIN in doses of two drops of a one per cent. strength solution of the hydrochlorate salt instilled into a healthy emmetropic or ametropic eye acts most quickly upon the ciliary muscle, producing paralysis of accommodation in twenty-eight minutes. The original near-point is regained in from four to five days' time*

DUBOISIN in a dose of the one-hundred-and-twentieth of a grain of the sulphate salt acts somewhat spasmodically upon the ciliary muscle; its action upon the iris is also more spasmodic but more prompt. Absolute palsy of accommodation takes place in an average time of forty minutes, while return of accommodative power to normal is not obtained until the tenth or the eleventh day. Carefully used, the drug is said to be of value to help relieve ciliary muscle spasm.†

CONDITIONS NECESSITATING THE EMPLOYMENT OF "MYDRIATICS."

Mydriatic drugs constitute the chief remedies offered to the ophthalmologist. They act locally, paralyzing the two important muscles in the interior of the eye, rendering the tissues more anemic, and acting as anodynes upon the peripheral nerve endings.‡ They pass directly

*In a series of experiments showing the effects of this drug in the one-fortieth, and the one-twentieth of a grain instillations, it was found that with the former amounts the near and the far points of healthy ametropic eye became one in from twenty to twenty-four minutes' time; while with the latter strength it took but eighteen to twenty minutes to accomplish the same result. The general symptoms of giddiness, inability to walk, weakness of the extremities, flushed face, and increased pulse-rate, were all so marked that the drug in these amounts was abandoned.

†A most interesting series of experiments showing the degrees of action of the one-hundred-and-twentieth, the one-sixtieth, and the one-fortieth of a grain instillations of the hydrobromate salt upon the ciliary muscle was conducted several years ago. The near-points rapidly receded to the far points in twenty-four, twenty, and eighteen minutes respectively.

‡It will be noticed that the writer in spite of much conclusive evidence, is still uncertain as to the supposed irritant action of these drugs upon the sympathetic. For this reason, any discussion upon this particular phase of the subject has been avoided until the completion of a number of experimental studies, etc.

through the various tissues of the anterior segment of the eye by osmosis and reach to a greater or less extent, some of the most important structures of the organ.

The local sedative and analgesic actions of these drugs upon the palpebral,* conjunctival, lacrymal, and corneal membranes, renders them valuable in the lessening of harmful pain and permits the performance of operative work without the use of general narcosis. The iridoplegic action is valuable in disease of the anterior portion of the uveal tract, while the cycloplegic action is desired in the estimation of errors of refraction and in the treatment of diseases which are situated more deeply within the interior of the organ—these three forms of action being increasingly useful in the order given, as the disorder requiring local treatment extends more and more deeply into the eyeball.

Conjunctivitis of microbic origin, in which there is danger of corneal involvement, should always have an appropriate amount of such drugs used as a part of the treatment. This should be done in order to place the intraocular tissues in the best possible condition for repair, as well as to obtain the least injurious results should they become either directly or indirectly involved.

Corneal disease of almost every type, from the most minute defect in the epithelium of the cornea to the grossest form of keratitic suppuration, demands the use of such drugs.† They are of particular value in the interstitial or parenchymatous types of inflammation.

They are valuable when carefully guarded and constantly watched, in temporarily continuing useful vision during a part of the interval preceding the removal of some varieties of cataract—especially the nuclear form. So much uncertainty is attached to the future welfare of an eye which contains a swollen lens and gradually weakening bloodvessels, that due care of the general and local states of health, must be exercised in instituting such a plan of treatment.

*Used here in the form of ointments, etc.

†As the result of extended and most satisfactory experience in the treatment of such cases, the writer has taught that more dependence can be placed upon this class of drugs than upon the miotics.

Diseases of the sclera are always bettered by the employment of the mydriatic drugs, particularly in the case of wounds and recent injuries.

In the treatment of diseases of the iris and ciliary body, they are absolute necessities. As previously stated, they should be used freely at first, and alternated and graded until the iris becomes fixed and quiet, and its tissues are freed as much as possible from both serum and blood.* In cases of total posterior synechia, it is best operatively to establish a communication between the posterior and the anterior chambers in spite of the inflammation, and then to employ or re-employ this class of drugs.† In general, wounds of the iris demand their use in association with frequent cleansings, iced compresses, and rest in bed for a few days. Any extruded bruised parts should be excised.

In sympathetic ophthalmitis, their use must be judiciously gauged. As a rule, however, this class of drugs if properly watched, is of the utmost value; and they frequently contribute not a little to the favorable outcome of the most desperate cases.

In glaucoma complex they must be eschewed. In glaucomatic tendencies of any kind occurring as secondary signs, they must, if used at all, be hourly watched and stopped at a moment's notice. It is certain that they have their function for good, even in these cases, but they must be used with discretion.

Active chorioidal disease is best cared for by their careful employment. Retinal disorder, and even optic nerve disturbance when situated anteriorly, are both benefitted by their employment; particularly by that group which acts the most profoundly and yet the most quietly upon the ciliary muscle.

*See article on The Hydrobromate of Scopolamine in Plastic Iritis by the writer, published in 'The American Journal of the Medical Sciences' for November, 1896

†Hypotonus of the globe is not so apt to follow this form of operation at this critical period in the life of the organ, as is so broadly believed. Should secondary glaucoma be pronounced, immediate removal of the lens in order to save an eye from destruction is a valuable procedure. Of necessity, however, every case must be treated according to its individual needs.

DANGERS OF IMPROPER AND UNDUE APPLICATION: MEANS OF
CONTROVERTING HARMFUL AND INJURIOUS
LOCALIZED EFFECTS.

As a broad rule it may be stated that all mydriatics increase intraocular pressure mechanically by crowding the iris-tissue into the angle of the anterior chamber, thus partially occluding the main excretory outlets for the lymph which is secreted within the eyeball. It is also possible that the drugs exercise a direct action upon the secretions of the lymph-glands themselves. (It is said through local excitation of the branches of the sympathetic); however it is certain that the iridoplegic and cycloplegic actions, as well as the relief of the terminations of the ciliary nerves from undue muscular pressure, must give rise to less serous exudation, less congestion, and less pain; and tend to permit the return of the intraocular tension to normal, particularly if the excretory canals and channels are again rendered patulous.

HOLOCAIN cannot be employed hypodermatically, by reason of a marked tendency thus to produce general toxic symptoms.

COCAIN used in greater amounts than is wise, or when too frequently repeated in the ordinary strengths, rapidly removes the epithelium of the cornea; this can be partially prevented by keeping the eyelids closed and covered with compresses dipped in warm water. In gross ulcerous conditions of the cornea, the drug should be most carefully applied if used at all, as it not only will lessen the resistance of the parts, and permit the entrance of ectogenous germs into the interior of the eyeball, but also will interfere with the production of a protective leucocytosis. The drug should never be employed in oily menstrea and gelatinous discs, because such methods are apt injudiciously to place a germ-bearing medium in a supposedly aseptic field.

Its use may produce glaucomatic attacks, as may any other of the mydriatics. This is true in spite of the fact that the drug may contract the ciliary bloodvessels and diminish the sensibility of the ciliary nerves: The angle of the anterior chamber is crowded by the dilation of the pupil and the important lymph outlets of the eyeball are consequently more prone to become blocked.

EUCAIN when first applied produces conjunctival irritation. Otherwise, the drug is subject, in a minor degree, to the disadvantages which attimes are found with the other more powerful members of its class.*

EUPHTHALMIN has been reported ascausing attacks of acute glaucoma. Although this condition may have followed the use of the drug, yet when properly employed it must be said that it rarely if ever produces any appreciable increase of intraocular tension.

HOMATROPIN quite frequently acts very irregularly upon both, the iris and the ciliary muscle, giving the pupillary area all manner of bizarreshapes, and the accommodative range all kinds of near points, until the pupil is dilated *ad maximum*, and the near and the far points are the same. Very frequently, the irregular paralyzant effects of the drug upon fibres of the ciliary muscle will rapidly produce changing, faulty curvature of the crystalline body, giving rise to temporary lenticular astigmatism. In addition, if the drug be forced upon the parts by rapid repetition, it will tend to produce an undue amount of congestion which is not only superficial, as is ordinarily the cause when it is employed in proper manner, but also exerts a harmful influence upon the interior of the eye, particularly upon the chorioidal coat. For these reasons, it is oftentimes useless, and at times harmful, as in some cases of ametropia, in which the very tissues which should be kept absolutely quiet during lens-testing and which may need prolonged rest from eye-strain, are involved.

Homatropin may be harmful in cases in which there are glaucomatic tendencies, through its effects on intraocular tension.

The statement that this drug is not liable to produce "dryness of the throat, flushing of the skin, and the ordinary symptoms of general intoxication" is inaccurate. On the contrary, the writer has not infrequently seen all of these conditions in clinics in which this drug is employed as a routine practice.

MYDRIN, the artificial combination of drugs, must of course, be as carefully watched as its individual equivalents; the combination rendering its action stronger and more powerful, and hence increasing its dangers.

*This is also true for ephedrin among the mydriatics.

ATROPIN. more than all of the other mydriatics, is liable in certain classes of subjects, to produce a hyperemia of the conjunctiva and an irritation of the adjacent skin of the lids and cheeks, which in neglected cases, will pass on to a true inflammation of the irritated parts. In such cases there is a hypercongestion of the blood and lymph channels, followed by an increase of the local secretions, and an undue shedding of the epithelial cells with a lax condition of the entire mucous membrane. Frequently, there is an associated palpebral eczema. In many instances, a true follicular conjunctivitis appears.

Most of these attacks of blepharo-conjunctivitis are best cared for by a change or a discontinuance of the drug. Unfortunately, most cases when once attacked, are prone to repetitions of the condition should the drug be renewed. The best treatment for the acute stage consists in thorough cleanliness, compresses (especially of weak chlorine water), either cold or warm as may be grateful to the subject, low percentages of cocain in saturated solutions of boric acid, and weak solutions of sulphate of zinc. In some of the chronic cases, weak solutions of nitrate of silver are beneficial when judiciously applied.

The condition is said to be due to a too long or improper continuance of the drug (particularly in peculiarly susceptible subjects), to impurities in the drug, to undue acidity or alkalinity of the solutions, and to contamination of the solutions with micro-organisms.

In cases of traumatic splits of the iris and ciliary muscles, care should be taken in the use of atropin (and in fact, in the employment of any of the mydriatics particularly the stronger ones), since a few of the latter rarer type of cases will never have a return of the power of accommodation, while the more frequent former class may permanently lose the ability for pupillary contraction.

Due care should be exercised that this drug, as well as all of its therapeutic relatives, is not received upon any abraded surface, as a much greater amount than is intended will pass very rapidly into the systemic circulation, and give rise to gross toxic symptoms. Absorption of the drug through the excretory portions of the lacrymal passages, with consequent general intoxication, should be avoided as much as possible by direct and indirect pres-

tures upon the canaliculi during instillation. Constitutional toxic symptoms are much less likely to occur if the excipient of the drug be some oily medium like castor oil or vaselin. Such materials, however, are uncleanly, and give a greasy covering to the cornea, which is both disturbing and misleading during the testing of refractive errors; moreover, as elsewhere stated, these menstrua favor the development of bacteria and are seldom aseptic. The placing of crystals of the drug in the conjunctival sac or their direct insertion into the anterior chamber is greatly to be condemned.

Idiosyncrasy toward the drug is at times expressed by a rapid temporary increase of intraocular pressure together with congestion of the scleral veins. Particularly is this true in old eyes with high degrees of hypermetropia, swollen lenses, shallow anterior chambers, and rigid scleras; conditions which are not infrequently found among certain classes of peoples.

SCOPOLAMIN. Increase of intraocular tension due to the influences of this drug is still the subject of argument. One who has learned empirically to distinguish the slightest tendency toward hypertonicity of an eyeball, which if disregarded, might lead to injurious consequences, and who is thoroughly careful, ought to have no unfavorable results in mydriatic therapy.

DATURIN, in a few instances, causes constitutional disturbances, such as faucial dryness, and a bitter taste, accompanied with flushing of the skin, headache, and giddiness. All of these symptoms and signs are usually of so mild a character as to be of no practical moment.

HYOSCYAMIN is preferable to duboisin, as it is not so apt to produce general intoxication. Unfortunately, hyoscyamin is prone to give rise to gross systemic disturbances, and for that reason must be carefully employed. In many instances, constitutional effects such as dry throat, flushed face, intense giddiness, and wakefulness followed by profound sleep, will soon occur.

HYOSCIN, in the one-hundred-and-twentieth and one-sixtieth of a grain dose of the hydrochlorate salt may produce fairly well pronounced toxic symptoms. In a few cases in which the one-fortieth of a grain of the drug has been used, an uncontrollable condition of drowsiness, fall

of pulse rate and giddiness, have followed its administration.*

DUBOISIN may give rise to general toxic effects, which at times are dangerous: dry throat, delirium, drowsiness, cephalalgia, loss of coördinating power over the extremities, temporary increase (followed by a prompt decrease) of pulse rate, redness of the skin, and relaxation of the sphincters, being not uncommon signs and symptoms when the drug is used in large amounts. However, the drug is valuable for use in procuring quick and ready relief of spasm of the iris muscle.

The local changes produced by hypertension of the eyeballs from the misuse of "mydriatics" call for the immediate disuse of the drug, the employment of eserine, combined with the constant or intermittent application of hot stupes. If these measures fail in the minor types of cases, or should the precipitation of a glaucomatous attack be sudden and pronounced, an immediate iridectomy, or a series of not very useful paracenteses may be brought into use.

The general toxic effects of this class of drugs are to be met by such antidotal treatment which may seem the most applicable and readily reached at the time.

The writer is deeply indebted to a number of his friends, among whom may be mentioned Drs. George H. Halberstadt, Charles W. Fox, George Y. MacCracken, Charles J. Hoban, Paul Guilford, A. S. Wilson, and Louis H. Préfontaine, for help throughout many of the personal experiments by means of which the data for the present article have been obtained.

*These statements are based on personal experiments.

PERITOMY OR PERIDECTOMY.*

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As is well known, the cornea during health is entirely devoid of bloodvessels but in the course of intense irritation and inflammation, its surface becomes vascularized to an extent greatly detrimental to its transparency. In such cases, the bloodvessels are derived from the conjunctiva and persist indefinitely in destroying the usefulness of the cornea of the affected eye unless prompt measures are taken to remove the cause and to obliterate the origin of the vessels. Any treatment that fails to combine these measures is, at best, but partially effective.

In all cases in which the surface of the cornea is abraded or ulcerated and even when diffusely clouded, it is the duty of the attending surgeon to examine the cornea with a high power lens to determine the presence or absence of radiating vessels at the margin. The causes of this vascularization are familiar to all; the condition can arise only from irritation to the surface epithelium or corneal inflammation. The most aggravated cases are seen in connection with trachoma, but it also attends corneal ulceration and inflammation from other causes. Pannus is the name applied to marked cases but frequently vessels form upon the cornea to which the term *pannus* would be inappropriate.

The measures to be adopted in these cases consist largely in treatment directed toward the original cause, but frequently these are either of little avail in removing the vessels or else the process is so slow, that the cornea becomes irreparably scarred in the meantime. The necessary adjunct to

*Abstract of a clinical lecture delivered at the Medico-Chirurgical College, Philadelphia, Pa.

the treatment then consists in cutting the bloodvessels at their origin in the conjunctiva and it is my purpose to show that this much maligned operation is productive of great benefit when properly performed, not alone, but in combination with treatment directed toward the causal condition.

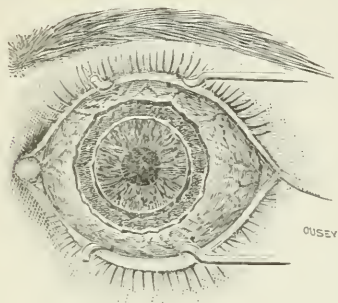


Fig. 1.
Peridectomy.

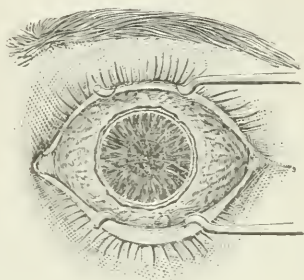


Fig. 2.
Peritomy.

The term *peritomy* or *syndectomy*, Fig. 2, is the term applied to the circumcision of the conjunctiva at the corneal limbus and *peridectomy*, Fig. 1, is used to designate the excision of a strip of the conjunctiva 5 mm. or more wide surrounding the cornea. The latter is but an elaboration of the former operation.

The original operation was that of peridectomy and was first performed by Furnari of Paris as early as 1842. The ravages of *trachoma* at that period and its frightful destruction of the cornea by fleshy masses suggested to this able surgeon that measures should be directed toward the cornea itself to maintain its transparency. His early operations were performed upon the natives of Algiers but his results were not published until 1862. In all probability, the operation suggested itself to the ingenious ophthalmic surgeons of previous years, when the long existence of *trachoma* is taken into consideration, but it is to Furnari we owe its introduction to the celebrated school of the nineteenth century.

The operation as performed by Furnari was more severe than that performed at the present time and the ill results attending its performance by other surgeons helped rele-

gate it to oblivion. His results, however, were most satisfactory and this serves to emphasize the oft-repeated statement that a surgeon's method should always be associated with the surgeon and not considered independently.

Furnari's operation consisted in first making an incision at the outer canthus after which a broad ring of bulbar conjunctiva was excised extending from the margin of the cornea to within 3 mm. of the line where the conjunctiva is reflected from the globe to the inner surface of the lid. A flap of conjunctiva at the margin of the cornea was allowed to remain until last, in order to fix and rotate the eye at the will of the surgeon during the operation. The subconjunctival tissue was then carefully dissected away so as to expose the sclera to view. The vessels of the cornea were then scarified, after which the sclera and ulcerated portions of the cornea were touched with silver nitrate.

The success attending Furnari's cases led other surgeons to practice this operation but with innumerable modifications; a peculiarity of the cult. One of the early and probably the best was to discard the cauterizing feature. Another was to enlarge the excised portion of the conjunctiva resulting almost invariably in symblepharon. Still later it was advised to merely incise the conjunctiva around the limbus, the fallacy of which was shown by the prompt union of the wound edges. Other observers recommended the operation as a substitute for other treatments for trachoma and so on until the procedure fell into disrepute.

Furnari's confidence in his own operation remained, however, and to show that he thoroughly understood its capabilities and range of usefulness one has but to read the following indications given by him for its performance:—

1. Membranous or fleshy pannus.
2. Phlebectasiæ of the conjunctiva or cornea.
3. Simple vascular keratitis.
4. Interlamellar infiltrations of the cornea.
5. Corneal lesions attending entropion, ectropion, trichiasis.
6. Staphyloma of the cornea.

After being used in trachoma as a "panacea" for a

great number of years it was practically dropped from the technic of ophthalmic surgeons to be revived within comparatively recent years by Heivetsen, Teale, Snell, myself and others. These gentlemen after an extended experience with the operation have reached the same conclusion enunciated years ago by Furnari.

The operation as performed at present consists in excising a strip of bulbar conjunctiva 2 to 5 mm. wide surrounding the cornea. The vessels on the cornea at the limbus are scarified by means of a Beer's knife but no cauterant is employed. The eye is anesthetized by the instillation of cocain (5 per cent. solution) and excessive hemorrhage may be controlled by the application of adrenalin (1 to 1000 solution). This is the operation referred to as peridectomy and should always be combined with treatment directed toward the underlying cause of the corneal vascularity.

Its principal indication is pannus, secondary to trachoma and other conditions irritating the cornea, corneal ulcers, and interstitial keratitis. It is also of value in some cases of iritis and kerato-iritis, particularly when complicated by vascularization of the cornea.

In 108 operations of this character performed by me within the last 3 years the results have been most gratifying. In all of these cases the progress of the affection was stayed. The excised portion of conjunctiva was replaced by white scar tissue and the transparency of the cornea was wonderfully improved. The operation has no substitute and deserves proper recognition by ophthalmic surgeons, as its results are superior to other forms of treatment in the conditions mentioned and it is productive of no ill effects.

EXTRACTION OF A PARTICLE OF STEEL FROM THE EYE WITH THE GIANT MAGNET.

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J. H., white, age 43, was struck by a flying piece of steel which entered the eyeball two mm. from margin of cornea and four mm. from attachment of external rectus muscle. Vision sank at once to light perception, pain began thirty six hours after injury and was severe for two days, yielding apparently to instillations of atropia, the pupil became dilated and vision one week later rose to 6/60. Eleven days from date of injury he came under my care. Enucleation had been advised and declined. Examination showed a moderately injected eye, pupil dilated *ad maximum*. At point described above, two millimetres from corneal margin, was a wound in sclera about three mm. long which had apparently healed. Ophthalmoscope showed the presence of the particle of steel just posterior to lens and above the center.

An approach to the eye with the Giant Magnet caused the particle to pass completely out of sight in the direction of magnet. As soon as the magnet was removed from the vicinity of the eye, the piece of steel assumed its original position behind the lens and above its centre. The only explanation of this phenomenon being that the vitreous by reason of elasticity allowed the fragment to be drawn against the chorioid without being lacerated, the gradually increasing traction force of the magnet favoring such an occurrence. When traction was removed, the elasticity of vitreous again drew the fragment to its original position. The force of magnet was seen to begin at a distance of about ten inches from the eye, a slight movement being perceptible and about six inches, movement of steel began toward magnet; all these movements were visible with ophthalmoscope through a widely dilated pupil. These observations were of course made in the initial examination

previous to the operation for removal. There was degeneration of vitreous, numbers of floating opacities being present and shifting with movements of eye. The disc and retina were unchanged, no retinal detachment being visible. The eye was prepared and an incision made with a Graefe knife through the insertion of external rectus muscle and parallel with its fibres. The incision was 4 mm. in length and entered the vitreous. The lips of the wound were separated by Stevens strabismus hooks and the tip of magnet brought to within $\frac{1}{8}$ of an inch of wound. After two attempts the particle of steel presented at wound and came out attached to one of the Strabismus hooks, the hook being in contact with magnet. A plain gauze dressing was applied and the eye bandaged. Healing was uneventful. There was no detachment of retina, infection or irido-cyclitis. Ten days later V—6/36. The particle of steel weighed one grain, was 2.5 mm. in length, 1.75 in breadth, 1 mm. in thickness.

This case presents one point of interest namely: that of almost entire absence of inflammatory reaction notwithstanding the presence of a piece of steel in vitreous for twelve days, and shows in addition the value of the Giant Magnet in preserving the eyeball.

THE VALUE OF THE SCREEN-TEST AS A PRECISE MEANS OF MEASURING SQUINT.

BY ALEXANDER DUANE, M. D.

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Most writers who treat of squint, speak of the screen-test as a method which may be used in measuring the deviation. They usually add, however, that at best it gives only a rough approximation to the true finding, so that other methods (the perimeter, etc.), are to be preferred.

While this may be so for the screen-test as usually performed, I venture to say that when properly done it is not surpassed in accuracy by any of the other objective methods; and, furthermore, that it possesses many advantages to which, at least in their entirety, no one of the other methods can lay claim.

This statement is based upon observations made in a very large number of cases during the past three or four years. These observations have in a cumulative degree confirmed and added to my belief in the value and reliability of this test, so that I now find myself depending more and more upon its findings and confiding in their accuracy.

Holding this conviction, I may be pardoned if I indicate at some length, first, the method to be pursued in securing such accurate results; and second, the ulterior advantages that this method seems to me to possess.

. METHOD EMPLOYED.

The *method employed* may be thus briefly stated:

The patient is placed with head erect and directly facing the test-object, which should be on a level with his eyes. The test-object itself should be conspicuous enough to attract and hold the patient's attention. A good object for the purpose, when the test is made at twenty feet, is a round target, a foot in diameter, colored black and with a white one-inch bull's-eye. When a more conspicuous ob-

ject is desired, as in the case of young children, or when one eye is quite amblyopic, a candle or small electric light may be used, set against a dark background. When testing for near points a small dot on a card at least several inches in diameter is used.

The patient's attention being directed to the test-object, a card is now passed quickly back and forth several times from one eye to the other, and the observer standing somewhat to one side, carefully watches both eyes and notes whether either one moves. If there is any notable deviation each eye will move perceptibly when covered (*movement behind the screen*), and will jump back to its original position of fixation again as soon as the screen is transferred to the other eye (*movement of redress*.) The movement behind the screen necessarily corresponds to the kind of deviation present, i. e., the right eye when covered will move inward if there is esophoria or esotropia, outward if there is exophoria or exotropia, upward if there is right hyperphoria or right hypertropia (*strabismus sursumvergens*) or left hypotropia (*strabismus deorsumvergens*), and downward if there is left hyperphoria; left hypertropia, or right hypotropia. The movement of redress is obviously in the opposite direction to the deviation, i. e., outward in case of esophoria, inward in case of exophoria, etc. The observer should try to make out both the movement behind the screen and the movement of redress, the latter being usually the easier to distinguish.

If there is no movement visible in either eye, and we are sure the patient is steadily fixing the object, he probably has *orthophoria* or within 2° of it. To determine this more precisely, we place a prism of 2° , base in, before the eye, and repeat the test. If he really has orthophoria, we shall now notice a slight, but distinct deviation inward of the eye behind the screen, and an equal movement of redress outward when the screen is transferred to the other eye. We then reverse the prism, placing it base out; if now there is a slight movement out behind the screen or a movement inward when the screen is transferred, the diagnosis of orthophoria is confirmed, for a patient whose eyes act thus cannot have more than a fraction of a degree of lateral deviation.

Similarly, a prism of 2° placed successively base up and

base down, may be used to demonstrate vertical orthophoria (absence of hyperphoria).

If the patient has an *esophoria* of 1° , then the first perceptible movement in behind the screen will occur with a prism of 1° or perhaps 2° , base in, and the first movement out with a prism of 3° or 4° , base out.

If he has an *exophoria* of 1° , it will take a prism of 3° , base in, to produce the first movement in behind the screen, and a prism of only 1° , base out, to produce the first movement out.

With deviations of 2° there is generally, and with deviations of 3° or over, we may say always, a screen movement observable. When this occurs we proceed to place prisms before one eye until the movement is first abolished, then over-corrected. If now, *we deduct 2° from the value of the first prism that produces over-correction, we shall get, in general, the true amount of the deviation (to within less than 1°).*

Thus, suppose that a patient shows a well marked deviation in behind the screen. We apply prisms, base out, and find that the deviation diminishes until, with a prism of 7° there is no movement visible. The same occurs with a prism of 8° or 9° , while with 10° there is a distinct movement out behind the screen. Then $10^\circ - 2^\circ = 8^\circ$, represents the degree of esophoria.

The test is enhanced in delicacy if we combine it with the *parallax test*. The patient here tells us, as the screen is passed from eye to eye, whether the test-object appears to have a movement or not. (The test-object in this case must be placed right on or close to its background, so that there shall be no movement due to projection). If, as his right eye is uncovered and his left covered, the object appears to move to the right, he has esophoria; if it moves to the left, he has exophoria; if it moves down, he has right hyperphoria; if up, he has left hyperphoria. The first prism which abolishes the movement indicates, in most cases, with great accuracy, the degree of deviation. Thus, a parallax movement corrected by a prism of 2° base in and 1° , base down, before the left eye, indicates an exophoria of 2° and a right hyperphoria of 1° .

This method, applicable to heterophoria of large or small amount, is *equally applicable to squints*. Here, of

course, in general, large correcting prisms must be used, and they must be applied until a distinct over-correction is produced, when, as before, the first over-correcting prism, less 2° , will represent the amount of the deviation.

The measurements obtained by this method are, of course, given in terms of the refracting angle of the prism used, and to reduce them to measures of arc, such as are given by the perimeter, we must employ some such table as the following:*

Refracting angle of prism	Deviation produced	Refracting angle of prism	Deviation produced
1	0.5	25	14.1
2	1.1	26	14.7
3	1.6	27	15.4
4	2.1	28	16.0
5	2.6	29	16.7
6	3.2	30	17.3
7	3.8	31	18.0
8	4.4	32	18.7
9	4.9	33	19.4
10	5.4	34	20.1
11	6.0	35	20.8
12	6.5	36	21.5
13	7.1	37	22.3
14	7.6	38	23.1
15	8.2	39	23.9
16	8.8	40	24.7
17	9.4	45	29.2
18	10.0	50	34.5
19	10.5	52	37.3
20	11.1	54	40.5
21	11.7	56	44.4
22	12.3	58	50.3
23	12.9	59	56.2
24	13.5	59.2	Total reflection

The prisms used may be numbered according to their angle of minimum deviation instead of according to their refracting angle. In this case the number marked upon the prism which abolishes the screen movement will denote directly the amount of the deviation in degrees of arc, so that no calculation will be necessary to determine

*Computed for a refractive index of 1.54 and with the prism held in the symmetrical position, i. e., held so that the incident ray is perpendicular to the line bisecting the apex angle of the prism.

the latter. Only it must be remembered that in this case we cannot without sensible error use two or more prisms together and assume that their sum represents the deviation that they produce. Thus we cannot say that the deviation which is abrogated by a prism of 11° (minimum deviation) and one of 8° (minimum deviation) placed on top of each other, is a deviation of 19° of arc. For a prism of 11° (minimum deviation) has a refracting angle of 20° , and one of 8° a refracting angle of almost 15° . The two together, making a prism of a refracting angle of 35° , will produce a deviation of 20.8° . I. e., our estimate of 19° would have been too small by nearly 2° of arc. Hence, if such prisms are used they should be employed singly, or, if employed in combination, their resultant value must be computed from the above table.

An argument against the accuracy of this measurement, particularly in squint, is that unless the prisms are held in just the proper position, they may give a *false measurement*, because the prism varies in strength according as its front face is tilted forward or back. If however, care is taken not to tilt the prism forward or back more than 10° from the symmetrical position,* no essential error will be produced in prisms of even 35° refracting angle. In fact it can readily be demonstrated by experiments with a tangent scale that, unless the prism is held very carelessly indeed, the error need not exceed 1° of arc. That is a prism of 35° (causing a deviation of 20.8°), if held in the symmetrical position will have to be rotated quite noticeably out or in, to produce an effect greater than that of a prism of 36° or at most one of 37° (producing a deviation of 22.3° .)

We can then without sensible error use a prism of 35° before each eye. The two prisms will measure a total actual deviation of 41.5° of arc; hence squints of at least that amount, can be measured with accuracy, and the measure of squints of 50° of arc can be closely approximated to. Squints of this amount it is rarely necessary to measure with any very scrupulous accuracy—variations of 2° or 3° being of no special moment. Hence this method even for these very large deviations answers all require-

*That is, a position in which a line bisecting the apex angle of the prism is perpendicular to the incident ray.

ments, so far as accuracy is concerned. For small deviations (below 20° of arc) it is rigidly accurate.

ADVANTAGES OF THE TEST.

What are the *advantages* that this method seems to offer over the others?

They are these:

1. The method, as we have seen, is *precise*—fully as much so as any of the other objective methods, and precise enough for all practical purposes in squint and in most cases of heterophoria too, except when there is a question of measuring fractions of a degree of heterophoria, when the more delicate, subjective methods (Maddox rod, parallax, and phorometer) must be employed.

2. The method is *reliable*, indicating truly the existence of a deviation and its amount.

In this important particular, experience has led me to place a very high value upon the test. In reliability, indeed, it seems to me to rank at least equally with any of the other objective tests (perimeter, etc.) and decidedly above any of the subjective tests (parallax, Maddox rod, and phorometer). I always use the latter whenever they are available, and find that the screen-test either gives results in accordance with them, or, when there is a discrepancy, gives results which are more uniformly consistent than they and evidently more nearly in harmony with the conditions actually present. The screen-test accordingly acts as a valuable check upon the other tests—either confirming them or else indicating how much they are at fault.

There is a certain class of cases in which the results of the screen-test and the other tests just mentioned (subjective tests) are necessarily discrepant. By the screen-test we determine the ability to perform fixation; by the other tests, the ability to recognize diplopia. If, on account of false projection or for other reasons, the position assigned to the double images in space does not conform to the position of the corresponding images on the retina, the results afforded by the phorometer, for instance, cannot agree with those given by the screen-test. This *incongruity* of the double images, by which with an

evident divergence of the eyes we have an homonymous diplopia or with an evident convergence a crossed diplopia, often occurs, as we all know, in squint, particularly after operations. *The screen-test here enables us to measure the amount of the incongruity* from time to time and thus determine whether it remains the same or is diminishing. Thus it may happen that immediately after an operation for squint we get with the screen an exophoria of 4° , but with the phorometer and Maddox rod an esophoria of 10° , and with the red glass an homonymous diplopia of 10° . The incongruity here is 14° . A little later, after training with prisms and in other ways, we find still about 4° of exophoria by the screen, but the esophoria by the Maddox rod, etc., has diminished to 5° . In other words, the incongruity is now only 9° . The diminution in this case would lead us to hope for further improvement and to feel that binocular single vision would ultimately be secured and that the eyes also would appear straight. But, if in the same case the exophoria shown by the screen had increased to 9° , while the esophoria shown by the other tests had diminished to 5° or 6° , we would know that the incongruity was no less than before, and should feel that binocular single vision might indeed be secured, but not unless the eyes noticeably diverged—in fact, not unless there was a divergent squint of some 14° or 15° . In the one case, the gradual disappearance of the incongruity would make it possible to secure both binocular single vision and binocular fixation; in the other, the persistence of the incongruity would make it impossible to secure both at the same time. In either event the screen-test by fixing the amount of the incongruity would determine the prognosis.

3. Extremely *small deviations*, i. e., those that do not exceed 1° or 2° , can be made out and measured with accuracy. In this regard, this method is easily superior to the perimeter test or to any of the methods in which we estimate the position of the eyes by the site of the corneal reflex.

4. It can be used to measure with accuracy *vertical deviations*.

5. Furthermore, we can by it measure a *vertical and a lateral deviation at the same time*. Thus, if there is a right hypertropia (strabismus sursumvergens) of 12° and an

exotropia of 15° present together in the same case, we shall by means of two prisms, one base down and the other base in, determine this combined deviation just as well as we could a simple vertical or a simple lateral squint. This is an advantage of no inconsiderable value.

6. It enables us to *differentiate with certainty a squint from a heterophoria and an alternating squint from one that is monocular*. This can be done with even very small deviations—and we must recollect that it is quite possible to have a squint of only 2° or 3° .

To tell whether the deviation, whether large or small, which we have demonstrated to exist by the method of alternate covering, is a squint or a heterophoria, we proceed as follows:

With the patient looking with both eyes at the test object and fixing it sharply, we suddenly place the screen before the right eye, then suddenly remove it. If, when we cover the right eye, and again when we uncover it, *that eye alone deviates*, we are dealing with a case of heterophoria. If *neither eye moves* (and yet alternate covering has shown us that there is a well-marked deviation), the right eye is squinting. If *both eyes move*, the left eye is squinting.

By repeating this test several times, first with one eye and then with the other, we can tell in a case of squint whether one eye squints constantly, or sometimes one, sometimes the other deviates (alternating squint).

7. It can be used to *measure paretic deviations*. In this case, the correcting prism should be placed before the paretic eye. Otherwise we shall get too high an estimate of the deviation, since we shall measure, not the primary deviation of the paretic eye, but the much larger secondary deviation of the sound eye.*

8. We can by this method determine the deviation *with the test-object at any distance desired*. This is a very important advantage, for our diagnosis of the nature of the anomaly present often depends upon our ascertaining

*By placing the correcting prism first before the paretic eye then before the sound eye, we may actually institute a comparison between the primary and secondary deviations—a comparison that can conceivably be of value in estimating the share that the paretis per se has in producing the deviations.

the relative amount of the deviation for distance and for near.

In the case of a convergent squint, for example, it becomes important to know whether the amount of esotropia for distance is greater than that for near or vice versa. If the former, we are probably dealing with a primary divergence-insufficiency; if the latter, with a convergence-excess. The treatment that we shall employ would be quite different in the two cases. So also, in the case of a divergent squint, if we find a marked deviation for distance and a slight deviation for near, we are probably dealing with a condition, which, primarily at least, was one of divergence-excess—a condition to be dealt with quite differently from a convergence-insufficiency, in which the squint would be marked for near and slight for distance.

For this reason the tests ought always to be made for both distance and near, and the findings compared. This comparison can be easily and quickly made with the screen-test. With other methods it is not so readily done—with some, indeed, it cannot be done at all.

9. By this method we can *determine the amount of the deviation in different directions of the gaze*, and hence even in the absence of diplopia or of a manifest limitation of the rotations of the eyes, ascertain whether the deviation is parietic or not. For example, suppose that the test shows us a moderate vertical deviation, say a right hyperphoria of 2° or 3°, in the primary position; when the eyes are directed up and to the left, we find this deviation very markedly increased, so that perhaps it takes 9° or 10° of prism to correct it; and when the gaze is directed up and to the right, simply a lateral deviation is noticed with the screen. In other words, we have a right hyperphoria which increases fast in looking up and to the left, and diminishes in looking up and to the right, a condition explicable only on the supposition that there is a paresis of the left superior rectus. There might be no manifest diplopia to aid the diagnosis; and the demonstration of a limitation of the movement of the left eye upward, even with the perimeter or tropometer, is often difficult or impossible, so that we are often deprived of this guide too; yet the screen-test, if carefully applied,

will enable us to determine the presence of paresis and the muscle affected.

10. We can use the method as well *with correcting glasses* as without. This is an important advantage, as we often wish to ascertain the effect these glasses have upon the deviation.

11. We can use the method with very young children, provided we exercise a little tact and patience and employ some sufficiently bright and conspicuous test-object.

12. The test can be made *quickly and with ease* it taking only a few minutes at most.

13. It *does not require any complicated apparatus*, the only appliances needed being a few square prisms, and even without these the kind of deviation can be determined, and in many cases its amount can be very closely approximated. It is not even necessary to use a frame for holding the prisms, the measurement being sufficiently accurate if the latter are held in the hand.

This absence of apparatus is particularly advantageous in the case of young children, who may be frightened or have their attention distracted when complicated instruments are used, or who are often tired out by the time spent in making the adjustments that such instruments require.

14. A last and very important advantage is that the test can be used *in estimating the effect of an operation*. Thus, when a tenotomy is being performed for a convergent squint, the screen-test applied during the operation enables us to tell how much deviation still remains for distance and for near, and thus informs us whether we have gone far enough or not.

It can be employed while the patient is still on the operating table and does not require the exercise of any judgment on his part — two facts which render it superior to most of the other tests, objective or subjective, that could be employed under these conditions.

My own experience has led me to use the screen-test as a matter of routine in operations, and to depend upon it more than upon any other single means of gauging the effect. I employ it often several times during the course of an operation, modifying the latter accordingly until the test shows that the condition is what it should be.

This does not, of course, necessarily mean, that I should push the operation until the screen-test shows orthophoria. Whether I do this or not will depend upon a variety of considerations. Thus if previous investigation has shown an incongruity of the double images of say 5° or 6° , I should make an allowance of at least this amount in estimating the effect of an operation. For what we seek to secure by our operation is to restore binocular single vision rather than strict binocular fixation. If, therefore, before the operation the screen-test showed a convergent squint of 25° , but there was an homonymous diplopia of only 17° or 18° , I should try to operate so as not to reduce the amount of convergent deviation to less than 7° or 8° as shown by the screen-test. Otherwise I should run the risk of producing a disagreeable crossed diplopia as the result of my operation.

So also in operating for a divergent squint, when we usually wish to produce an over-correction, I should not be satisfied with the result until the screen-test showed an esophoria of 8° or 10° .

CONCLUSIONS.

Of any test that may be used in measuring squint we should ask:

Is it reliable?

Is it precise?

Is it readily applied and universally available?

If the statements made in this article are correct—and I feel sure that those who make a careful trial of the test will agree with me in thinking that they are so—the screen-test answers all these requirements.

It is reliable—more so than any other single test.

It is precise—quite enough so certainly for all purposes in measuring squint.

It is eminently easy and quick of application, and can be employed under all conditions—surpassing in this regard most of the other tests.

It has furthermore numerous other special advantages which are presented in detail above.

It seems, therefore, deserving of much higher consideration and much more frequent employment than it has hitherto received.

ABSTRACTS FROM AMERICAN AND ENGLISH
OPHTHALMIC LITERATURE.

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Exsection of the So-called Tarsal Cartilage in Cases of Chronic
Trachoma.

WOOD, CASEY, A. Chicago (*Am. Journ. Ophth.*, July, 1903), does not consider the Heistrath operation applicable in any of the recent or acute forms, where there is a reasonable prospect of early cure from any other form of treatment, nor, again, in the most advanced stage, in cicatricial forms which have gone on to shrinking of the sac and in which there are few or no active granulations in the tarsus, nor, finally when it is possible to remove the discrete and scattered nodules one by one.

Removal of the tarsus, in part or as a whole, is indicated in those long standing cases of trachoma, not amenable to other forms of treatment, in which the lids show trachomatous infiltration, with granulation deposits

in the fornix folds, whether the cornea be affected or not. If the tarsus itself is thickened and enlarged, if there is evident disease of the folds without apparent thickening of the tarsus, but with involvement of the cornea, or if with atrophy or cure of old granulations in the folds there remain deep seated foci in the tarsus, the operation is urgently indicated and gives gratifying results. Excision of the fornix folds (Richet, Galezowskib) does not meet the requirements in such cases as the palpebral conjunctiva is rarely the only site of granulations, and it is quite exceptional that the tarsus and sub-mucous connective tissue escape. Wood does not hesitate to excise the tarsus either in the presence of corneal ulcer, increasing pannus or during an acute exacerbation, removing the stitches as early as possible and keeping up constant disinfection of the eye while they are in situ. General narcosis is advisable.

The steps of the operation illustrated by diagrams from Kuhnt's work, are as follows. The lid is everted so that the convex border of the tarsus is thoroughly exposed, grasped by two strong, toothed forceps at the junction of the middle with outer and inner thirds of the margin, and drawn firmly upward by an assistant. Following the margin of the diseased area an incision is made from the outer* to the inner canthus through the conjunctiva only. Unless the conjunctiva is bound down by adhesions, the wound will gape and reveal the fibres of Müller's muscle (expansion of the levator passing to the tarsus). Three stitches are passed through the bulbar margin of the incision including only conjunctiva and a few fibres of the sub-mucosa. If more than one mm. in width of conjunctiva is included in the sutures, small symblepharon folds may form opposite each stich, and if too deeply inserted there will be a noticeable dragging on the lid edges. The sutures are made of No. 2 black braided silk, sterilized by boiling, dehydrated in absolute alcohol, and preserved in paraffin containing 25 per cent. of vaseline. The bulbar conjunctiva is now separated from the globe a distance of 3 to 5 mm. from the edge of the wound. The forceps may now be removed from the tarsus and the lid margin grasped at its middle point, a horn spatula being passed behind the everted lid. A second incision run-

ning the whole length of and parallel to the lid edge, is now made as nearly as possible in healthy conjunctiva, removing as little normal mucous membrane as possible. The tissue at the nasal junction of the two incisions are now seized and conjunctiva and tarsus excised, avoiding the orbicularis and Müller's muscle. After the bleeding has ceased, the conjunctival sac is irrigated and the lips of the wound brought together, taking care to place each suture in both wound margins so that it will be exactly opposite its fellow when the eye is closed. The bulbar conjunctiva should not be put too much on the stretch. It is advisable to allow the patient to recover from the anesthetic sufficiently to enable him to determine accurately whether the lid movements are sufficient and to be sure that there is no irregularity of the lid margins.

After treatment consists in irrigation with warm boric acid solution four or five times daily, followed by the instillation of warmed and sterile vaseline. The sutures are removed on the fourth or fifth day. Soon after the photophobia, lacrimation, and foreign body sensations disappear; pannus is always lessened and sometimes abolished, as a direct consequence sight is much improved, as is the asthenopia generally exhibited in the better eye of unilateral chronic trachoma, and a return of recurrent corneal ulcer is prevented.

Ptosis and entropion after this operation have not been observed by Wood, because the levator is not attached to the tarsus alone, and because the removal of a shrinking and diseased tarsal cartilage does away with a prominent factor in the production of lid edge incurvation. Entropion and trichiasis are often decidedly less marked. Ulcer of the cornea should not occur with specially prepared sutures.

Slight Modifications of the Van Millingen and of the Hotz-Anagnostakis Operations for Entropium.

“GIFFORD, HAROLD, Omaha. (*Ophth. Record*, July, 1903.) In marked entropium of the upper lid and nearly all cases where the lower lid has been affected, I have for years relied almost entirely on the Van Millingen operation. The only reasons which I can advance for the comparative unpopularity of this operation are: 1st, the difficulty of making

the cut in the lip margin gap widely enough; 2nd, the tendency to put in too short a flap, the temptation not to extend the cut into portions of the lid where no lashes are turning in being too great to be resisted except after considerable experience. To obviate the first difficulty, instead of introducing the sutures intended to make the incision gap, in the way recommended by Van Millingen (namely, first through the edge of the lid, then through the skin high up toward the brow, which generally everts the whole lid instead of widening the cut), I have put the sutures, three or four in number, first through the margin of the lid immediately external to the incision, then through a narrow fold of the loose skin of the lid about three-sixteenths of an inch above (or in the case of the lower lid, below) the lashes. A bit of absorbent cotton, wet in sterilized boracic solution is then made into a firm roll about one-eighth inch in diameter and one-half in length and is tucked under the free portions of the sutures so that when the latter are tightened the roll is pressed down into the tissues just above the edge of the tarsus, thus everting the outer margin of the tarsal incision without everting the lid as a whole. Before tightening each knot it is well, while the ends of the thread are held with one hand, to push the roll of cotton firmly against the tissue with a pair of forceps so that the eversion may be accomplished with the least possible strain on the sutures; the incision also gaps more easily if, just before tying the knots, it is reopened by running some blunt instrument along its bottom from one end to the other. The lid is then protected from infection by a moist pad of cotton while the lip flap is excised. For this excision a larger clamp than the ordinary Demarres is desirable. The open space within the fenestrum should be at least an inch and a half in its longest diameter in order to obtain a long enough flap for some lids without loosening and resetting it. The lip flap should be nearly one-eighth inch wide and should have the sub-mucous tissue trimmed off, but care should be taken not to make it too thin or it will not hold the edges of the cut apart after the stitches are taken out. Sutures to hold this flap in position are not necessary if it is carefully pressed down into the cut with moist forceps or a moist swab and a suitable dressing applied.

For this purpose I generally first apply a thin sheet of wet absorbent cotton thickly smeared with sterile white vaseline upon which iodoform is finely powdered. This is laid on the outer surface of the operated lid and the edge tucked over the flap so as to lie between it and the edge of the opposing lid when the lids are closed. Over this more wet cotton is laid, then gutta percha tissue, then more cotton fastened at the edges with collodion, and a very carefully applied bandage, which is generally not changed for three to five days. After the fifth day the bandage can generally be left off, but for several days thereafter it is well to apply white vaseline to the edges of the lids several times a day to keep the flap from getting dry. I think it unadvisable to operate upon both lids of the same eye at one sitting unless the circumstances are unusually urgent.

In deciding just where to make the incision the utmost care must be taken to leave all the hair bulbs in the outer flap, since if, after the flap heals in, any lashes appear between it and the globe they are very difficult to deal with; but in striving to avoid this, if the cut is made too far in, the inner flap is so thin that it is difficult to obtain a proper gaping of the incision.

The incision should extend well beyond the inverted portions of the lid and except where the trichiasis is confined to the center of the lid, the cut should go well out into the skin at each extremity of the tarsus.

A MODIFIED HOTZ-ANAGNOSTAKIS OPERATION.

For some years in doing the Hotz operation (which I use for the lower grades of entropium) after getting the sutures in place, I have, before tying them, everted the tarsus and made an incision through its entire thickness from end to end, not more than 3 mm. from the lid margin. After this, when the sutures are tied their effect is distinctly greater than without the Von Bürow incision. This of course makes a combination very similar to Green's operation, but the principle of the Hotz operation is so important that the two should not be confused.

One disadvantage of the Hotz stitch, as applied to cases in which lashes at the extremities of the lids turn in, is

that the tarsus is here so narrow that it is often impossible, if the stitches are put straight through, to get sufficient purchase on it to turn the lashes out; and to overcome this difficulty I have made the sutures at the extremities of the lids take a zigzag course; this produces a slight temporary puckering of the skin, but the effect of such a stitch on the eversion of the tarsal edge is manifestly greater than where the thread is put through in a straight line.

I also believe it is well to excise a very narrow strip of skin with the orbicularis fibres and, as recommended particularly by Schnabel, I make the incision not more than one-eighth inch from the lashes in the center and rather less than this at the extremities.

One objection to these operations and all others that I have seen tried for entropium, is that when done during the latter stages of trachoma, slight ulcerations of the cornea occasionally develop under the bandage, after the third or fourth day. These usually are of no consequence, but in three of my cases the ulceration has been so serious as to leave some slight impairment of vision; so that in spite of my fondness for these operations, if I could find another equally effective which would not be open to the same charge I should be glad to adopt it."

The Operative Treatment of Myopia.

FROST, W. ADAMS, London (*The Ophthalmoscope*, Vol. 7, No. 1, July, 1903), traces the history of the introduction and popularization of this procedure, and reports 31 cases (33 eyes) in his own practice, of which only 4 were over thirty the average age of the remainder being 19 1/2 years.

His conclusions are.—1. The operation should be restricted to patients whose actual myopia is not less than 12. D. (that is, who require a correcting lens of not less than 13.5 D.) 2. The patient should be able to read Jag. 1 without glasses with each eye. 3. After the entire removal of the lens, the distant vision, *without glasses* is usually at least as good as it was before *with glasses* and with correction it is usually much better. 4. The operation should be limited to the more myopic eye, except under special circumstances.

Six of the writer's cases returned after various intervals with detachment of the retina in the eye operated on, and not in the other. In one of these the interval was only three months, but in the others it seemed too long to establish any connection between the operation and the detachment.

Cases which have been operated on for lamellar cataract do not seem to be especially liable to detachment, and the liability of high myopia to detachment is sufficient to explain the occurrence; it seems a reasonable inference that the myopia, and not the operation, was the cause of the detachment.

The Cosmetic Value of Paraffin Injections After Enucleation of The Eyeball.

RAMSAY, A. MAITLAND, Glasgow (*Ophth. Review*, July, 1903), now divides the conjunctiva close to the corneal margin, catching up each rectus muscle on a squint hook, and passing a strand of catgut, knotted at one end, through tendon and overlying conjunctiva. The tendons of the recti muscles are cut at their insertion into the sclera and the operation completed in the ordinary manner. The capsule is opened by holding the muscles on the stretch and packed with gauze moistened in adrenalin, after which a strong black silk purse string suture is passed round its mouth. The gauze is now removed and the now dry socket filled with sterilized paraffin melting at 104° F. The syringe is a metal one rubber jacketed, with visible graduation. It has two side rings so that it can be held firmly by the first and second fingers, while the thumb is passed through the loop at the end of the piston. The nozzle is inserted into the capsule of Tenon, the suture drawn tightly round it and the paraffin injected. After withdrawing the nozzle, the suture is drawn still tighter and knotted. The catgut sutures are then tied in opposite pairs, thus inducing the paraffin to mould itself in the socket and to form a stump to which the divided muscles readily attach themselves.

There is generally considerable inflammatory reaction but this and the discomfort, which with care, is never so great as to keep the patient from sleeping, are allayed by hot douching for several days. The suture is removed

after two weeks. Three or four weeks later an artificial eye can be adjusted, the Snellen model sometimes giving better results. To insure a perfect fit, a plaster cast of the socket may be taken. Careful placing of the purse suture and avoidance of sepsis are essential. The operation should not be attempted in case the eyeball is in a state of active suppuration. In the author's series of thirty-four cases the paraffin came out three times, but in two of these the conjunctiva was simply drawn together by the muscle sutures. In one enucleation of a suppurating globe, pus appeared and the paraffin was removed. Sympathetic inflammation was observed once, but R. does not think that any blame can be attached to the paraffin, as the case was one of septic wound in which after enucleation the optic nerve was found acutely inflamed.

The advantage is not so much in the greater mobility of the prothesis as in the minimizing of the flat sunken appearance of the upper lid which nearly always follows simple enucleation.

A Case of Paraffin Injection into the Nose Followed Immediately by Blindness from Embolism of the Central Artery of the Retina.

HURD, LEE MAIDMENT, and HOLDEN, WARD A., New York (*Med. Record*, July 11, 1903), add another to the list of unfortunate results following paraffin injections which permitted the study of the retinal changes almost from the time of formation of a true embolism.

The injection was the third of a series performed for correction of a saddle nose. "A mixture of paraffin (130° F.) and ordinary white vaseline, having together a melting point of 110° F., of semisolid consistency, was injected without the previous use of cocain, the needle being introduced first at the tip of the nose and pushed upward an inch, and then introduced at the root of the nose and pushed down to a spot just above the former injection. At this time the patient was seen to rub his right eye, and in reply to a question, he said that he could not see with it. A little later ecchymosses appeared about the tip of the nose, indicating that a vein had been punctured. Twenty-five minutes after the injection exam-

ination showed dilatation of the right pupil and loss of response to light. The retinal veins were normal. The main inferior branch of the central artery and its divisions, however, were empty and collapsed, being recognizable only by the faint white outlines of their lateral walls. The main superior branch contains some blood, but when gentle pressure was made upon the eyeball, the blood column here broke up and the blood flowed backward into the central artery." Within three hours retinal edema became marked, and the "usual red spot at the macula" was plainly seen. Energetic treatment which consisted in inhalations of nitrite of amyl, massage of the globe, and administration of digitalis later of glonoin, was established at once but without any improvement in vision. The authors find but one similar case, that of Diser, on record. "The obvious lessons taught by these cases is that loss of vision and even of life may follow the injection of paraffin into a vein." Preliminary aspiration might be a partial safeguard against this accident. At all events, the operation is not so lacking in danger as the frequency with which it is done to improve the appearance or increase the comfort of the patient would seem to indicate.

Subconjunctival Medication, with Special Reference to the Use
o. Salt Sugar Solution in Acute Affections of the
Anterior Portion of the Eye.

MORTON, HOWARD MCL., Minneapolis. (*N. Y. Med. Jour.*, July 18, 1903.) The writer's experience leads him to think, as does Vogel, that any favorable results following subconjunctival injections are due rather to the quantity of the fluid used than to any direct drug action, as the aqueous contains, after the use of a 1 per cent. solution of the mercury salts, but 1 to 100,000. In binocular acute inflammation it appears "that an injection of a large amount—two to six grammes—of sterile water alone, produced in the one eye a more rapid resolution of the inflammation than the chemical agent, carried in a smaller amount of fluid, brought about in the other," and that sterile water caused less pain. This seemed to show that a readily diffusible and sterile solution would be the best, and the writer has for some years used physiological salt

with 3 per cent. sugar solution. He believes that the beneficial results follow on account of a rapid augmentation of the lymphatic and blood channels by direct diffusion into them and of the dilution of the toxic products about the focus of inflammation.

In pneumococcus keratitis, plastic iritis associated with rheumatic disease, especially where involvement of the entire anterior portion of the eye exists, in traumatic infected corneal ulcer, and in dendritic keratitis, 2 to 4 grammes—or even to 6 grammes—of salt—sugar solution are injected, 1 ccm. at a time, introducing the syringe at several points just anterior to the insertion of the recti. In strong individuals with one eye affected this is “very properly an office procedure,” to be followed by pressure and hot fomentations for periods of five minutes, with half hour intervals. The field of frequent and routine injections is limited to the more severe and intractable cases. In some of these, ‘sub-conjunctival injection of sugar—salt solutions do assist in promoting resolution more rapidly than do the usual local measures, showing greater comfort to the patient and more rapid recovery where a bi-lateral comparison of the methods was instituted.

The Present Status of Subconjunctival Injections in Ophthalmic Therapeutics.

BULL, CHARLES S., New York (*Med. Record*, July 18, 1903), gives a complete review of the literature on this subject for the past seven years. The contradictory evidence has been carefully studied to separate the wheat from the chaff. One conclusion is irresistible, viz., “that the efficiency of these various solutions injected beneath the ocular conjunctiva cannot be ascribed to the increased local acceleration of the lymph-currents, the so-called leucocytosis, nor to the antiseptic action of the remedies employed, since the presence of such processes cannot be demonstrated in the tissues of the eye following the injections. The chief change seems to be in the composition of the aqueous humor.” The latter becomes hemolytic and richer in albuminoids from the irritating action of the injections which cause congestion and increased transudation, from the blood-vessels, of albumin-

oids with which, it is now known, the protective substances of the blood are always found.

Bull has used this method in many cases during the past three years. Sodium chloride, sublimate, mercuric cyanide, and hetol of varying strength were tried. No important differences in mode of action or effect were seen between salt solutions and those of mercuric cyanide "so highly extolled by Darier." The latter, even when cocain or acoin was added to the (1:5,000) solution before injection, always caused a great deal of reaction, severe pain, and conjunctival inflammation, and was followed by persistent chemosis and hypersensitiveness of the conjunctiva. Hetol (sodium cinnamate) was used in a 1 per cent. solution, half a gram being injected, after cocain, at first every other day. It "seemed to influence favorably the course of the disease in herpes and interstitial keratitis," to be of benefit in hastening absorption in acute uveitis, and to be of no use in chronic cases, notably in scleritis. Bull concludes that this method does not "bring about any more rapid or favorable results than those we have hitherto employed in affections of the cornea, uveal tract, or retina. "In orbital cellulitis of an infective nature, however, bichloride (1:1000) did exert a very favorable and unusually rapid effect in hastening the suppurative stage.

All reports of the beneficial effects of sub-conjunctival injections should be carefully criticized and compared with the results obtained by other methods of treatment before accepting them as of any real value.

Localization of Foreign Bodies in the Eye and their Removal.

DEAN, LOUIS C., San Francisco (*Am. Journal Med. Sci.*, July, 1903), employs a localizer for use with the x-ray constructed after the pattern of a machine devised by Mackenzie Davidson, of London, and based on the well-known method of taking two separate radiographs of an object held immovable, from two different points of view and calculating the relative displacement of each in regard to certain fixed markings, to determine its distance from the plate. Exact working figures are thus given so that it is possible by the simplest methods of triangulation to arrive at exact conclusions.

The machine consists of a framework supporting two cross wires at right angles to each other, and has a mechanism to hold a Crooke's tube in a certain position so that the luminous point of rays emanating from the anode (Kathode? P. F.) is perpendicular to both. The head is then clasped in the machine and held immovable after proper localizers are placed on the face to determine the median line of the head, the vertical meridian of the eye, and the lower limbus of the cornea. Two photographs are taken at equal distances but in opposite directions from the horizontal wire, and with the data at hand the location of a foreign body can be determined within one millimetre. The author details a series of cases, with illustrations, in which his method was successfully applied. In some, the giant magnet and sideroscope gave an equivocal result or were inapplicable, as in shot wounds and in retention of other non-magnetizable foreign bodies.

A New Model of the Clinoscope.

STEVENS, GEORGE T., New York (*Med. Record*, July 11, 1903), has changed the mechanism of his instrument so that it can be used for physiological experiments, is less expensive, more portable, and allows the objectives to be better seen. The tubes are smaller and shorter, permitting a convergence of about 15° for each tube for experimentation. When in ordinary practical use the tubes are restored to parallelism. Owing to the diminished size of the tubes, the image is apparently larger than in the earlier model. The objectives may with any dip of the tubes, remain in the vertical plane, allowing examination with depression of the line of sight. The posterior halves of the tubes do not rotate, thus causing no variation in the level of the two sight holes which are made so small as to render refracting glasses generally unnecessary. Rotation is affected by levers instead of a screw-gear.

A Balance For Knife Testing.

SMITH, PRIESTLY, Birmingham (*Ophth. Review*, Aug. 1903), has devised a simple instrument to determine by actual measurement the pressure which we have to employ to cut or puncture the leather of the test-drum. It resembles a see-saw in miniature. One arm of the beam

carries a small drum covered with the thin white kid (shagreen) sold for this special purpose; the other is marked with a scale indicating grammes, and carries a sliding weight which gives to the drum an upward pressure varying from 0 to 18 grammes.

To test the point of a knife, the drum is placed in a horizontal plane, the point gently pressed against the leather, and the weight moved until the knife persistently punctures the leather instead of depressing the beam. All punctures should be made in the transverse diameter of the drum so as to be at the same distance from the fulcrum.

To test the edge, the drum is placed on edge, vertically, and the knife, passed through a slit in the leather, is pressed downward without thrusting or sawing. Using a given piece of leather for all, a number of knives may be compared and placed correctly in order of merit. We can measure the effect on a given knife of immersion in boiling water, of antiseptic fluids, or of use, and compare various models of puncturing or cutting instruments.

Good Graefe knives, new or newly sharpened, puncture at a pressure of 1 to 2 grammes. They cut at from 10 to 14 grammes, and with a tight leather some of them at 8 grammes. As a rule they cut more easily near to the point. Cataract needle-knives cut at 14 to 18 grammes. Cystitomes, new, punctured at 4 to 8 grammes; resharpened, at 10 to 18 grammes.

Large Piece of Glass Imbedded in the Orbit for Twenty Years Without Causing Symptoms; Removal.

EWART, J. HOGGAN, Folkestone (*Lancet*, Aug. 1, 1903), reports the case of a woman who presented herself with "a small sinus situated about two centimetres above the inner canthus of her left eye. The injury had originally been caused by a clock falling on her head, the glass of which made a deep cut across, and to the outer side of her left eye-brow. This was sewn up and with the exception of a slight pricking about eight years ago which quickly passed off and a puckering of the skin over the inner side of the upper eye-lid there were no symptoms until about three weeks ago when the skin broke and there was a slight watery discharge. Probing

the small opening, a large triangular piece of glass, measuring 3 centimetres in length, 1 centimeter in breadth, and 1.75 millimetres in thickness was found deeply imbedded transversely above the eye, the apex, lying on the nasal bones, being easily felt under the skin.

It is remarkable that this foreign body should have remained in situ so long a time without causing symptoms or damaging the eye ball, upon which it might easily have encroached, the edges being quite sharp. "It was much cracked." I was therefore glad that after a trial with a pair of forceps I removed it digitally or it would most certainly have splintered and caused great trouble.

Eye Complications of Small Pox.

BAKER, ALBERT RUFUS, Cleveland. (*Jour. Amer. Med. Assn.*, Sept. 12 1903.) "From 1898 to 1901, inclusive, an epidemic prevailed in Cleveland of a mild variola. In 1898 there were 48 cases and no deaths; 1899, 475 cases and 3 deaths; 1900, 993 cases and 16 deaths, and in 1901, from January 1 to August 23, 1,230 cases and 20 deaths, making a total of 2,746 cases and 39 deaths during the four years. The mortality was less than .015 per cent.

The total number of cases for 1902 was 1,248, with 224 deaths. The death rate was 17.9 per cent., and, as Dr. Probst well said: "This was the genuine old-fashioned smallpox." Many of the cases were of the most malignant character and exceedingly contagious, unlike the mild form of the disease which hitherto prevailed.

During the entire epidemic of mild smallpox, in which 2,746 cases were reported, not a single one of severe eye complications came under my observation, and I have not heard of any cases among my confreres."

"During the recent epidemic there have been a number of cases of serious eye complications," twenty-three of these cases are briefly reported. At the Detention Hospital 425 cases were admitted, of these there were 16 cases of late eye involvement, 13 of one eye and 3 of both or about 3 $\frac{3}{4}$ per cent.

"Which would give us between 45 and 50 cases during the entire epidemic. I think this approximately correct.

The severity of this infective process may be better appreciated when we recall that of the above 23 cases, 4 are

blind in both eyes, with little hope of improvement; 8 have either been enucleated or atrophied from panophthalmitis; 6 are blind in one eye, but the form of the eyeball is preserved. It is probable that several of these will have to be enucleated later. Three have vision of less than 20/200 and not more than 5 have vision better than 20/200, and 2 have corneal fistula and are still under observations."

"All these patients had severe confluent variola. In not a single case could be elicited a history of having been successfully vaccinated.

In all of the cases attention was called to the corneal lesions relatively late in the disease, about the end of the second, or beginning of the third week, and in a few cases much later. Case 12 was discharged from the hospital with a small ulcer of the cornea, but three weeks later panophthalmitis developed.

A number of these cases were examined bacteriologically and streptococci were always found. Occasionally a mixed infection, with staphylococcus, was present.

Most severe cases of variola have a conjunctivitis and great swelling of the lids early in the disease, and frequently it is impossible to open the eye so as to see the cornea for several days. The fear that destructive corneal lesions may be transpiring unobserved beneath the greatly swollen lids is not often realized; for when the lids can be first opened the cornea will be found clear. The first indication of corneal complications will usually be noticed several days later, after pus and crusts have been forming, and it is quite certain the infection is carried into the eye from the skin on the fingers, handkerchief, dressing, eye-droppers, or directly from crusts on the edges of the lids.

As soon as this was observed every possible precaution was taken to disinfect the structures around the eye, with the result of an appreciable falling off in the number of eye complications.

All of the cases began relatively late in the disease, and were due to a secondary infection, although it is quite possible that there may have been some slight abrasion of the cornea as the result of a primary lesion, thereby permitting the entrance of pathogenic germs later.

Early in the epidemic, while laboring under the belief

that the eyes were destroyed as the result of a primary lesion of the conjunctiva or cornea, cases were treated with instillations of 1 per cent. solution of nitrate of silver as a prophylactic, but it seemed with deleterious results. Then protargol, formalin and other disinfectants were used, with no better success. Later, subconjunctival injections of bichlorid were used in several cases without benefit. Fewer cases of corneal complications developed, and our cases progressed better when a routine practice was adopted of frequent washing of the face and lids with 1/4000 bichlorid and flooding the conjunctiva four or five times daily with saturated boric acid solution, and on the first evidence of corneal complications an instillation of 1 per cent. solution of atropia sulphate two or three times daily. The later treatment of these cases was in no way different than that of corneal ulcers from any other cause.

In conclusion, I wish to observe:

1. In view of the growing sentiment against vaccination almost any community is liable to experience an epidemic as disastrous as that through which Cleveland has just passed.

2. The eye complications of smallpox are greatly to be feared. The dangerous corneal complication is a secondary infection, commencing about the twelfth day, but many come much later.

3. The infection in the Cleveland epidemic was a streptococcus one, and different in no way from similar infection of the eyes of a patient already much exhausted from a serious disease.

4. No specific prophylatic treatment has been found, and the best that can be done is to keep the face and eye in as nearly an aseptic condition as possible by frequent washing and the use of such an antiseptics as will prove the least harmful to the eye."

A Case of Panophthalmitis in Typhoid Fever.

GILFILLAN, W. WHITEHAED (*New York Med. News*, July 25, 1903), reports the occurrence of this rare complication in a young adult male. On the twenty-sixth day of the fever the lids became swollen and edematous with considerable redness of the skin. The conjunctiva was intensely reddened and also very edematous, the cornea dull, with a

diffused cloudiness. The eye ball was markedly protruded. The affected eye fortunately for the patient was one which was blind as the result of an injury received seventeen years previously. In spite of treatment the condition progressed and perforation of the sclera took place. The panophthalmitis ran a rather rapid course, discharge ceasing and the eye becoming phthisical in about one month, whereas these cases generally run six to eight weeks.

Control of Suppuration of the Anterior Segment of the Eye by the Insertion of Iodoform into the Anterior Chamber.

ELLETT, E. C., Memphis. (*Jour. Amer. Med. Assn.*, Aug. 8, 1903.) Seven experiments were made upon rabbits with the following results.

"Iodoform used in three cases of streptococcus infection. One failure, two successes.

Iodoform used in two cases of staphylococcus infection. Two successes.

One case of streptococcus infection not treated. The animal was destroyed at a time when sloughing of the cornea appeared imminent. One clinical case is reported.

"This case occurred before I had undertaken these experiments. I now know with how much more ease the iodoform can be handled in the shape of the rods, and also the necessity of its early and repeated use.

The iodoform rods used in these experiment were made of gelatin containing 50 per cent. of iodoform. These substances are mixed hot and poured on a clean tin plate to harden. The resulting film is then cut into the required sizes. The procedures on the eyes were carried out under local anesthesia, and with usual antiseptic precautions.

In regard to technic of the introduction of these rods into the eye, it presents no difficulties at all. A peripheral incision in the cornea is made and the rod caught at one end with any fine forceps and pushed into the eye. It should enter the eye completely, leaving no part protruding. The gelatin softens very quickly on exposure to moisture, necessitating quick handling of it.

To be of any value, it must be used early, probably on the first, certainly not later than the second day after infection

and should be repeated daily until positive improvement is manifest, or until its failure to control the condition is apparent. With small rods the dose should be three or four rods. It would be best to use at the same time such local antiseptic and general supporting measures as our experience has shown to possess some value."

Vernal Conjunctivitis.

POSEY, WM. CAMPBELL, Philadelphia. (*Jour. A. M. A.*, July 25, 1903.) Vernal conjunctivitis as we know it to day consists of an inflammation of the conjunctiva, at times of the lid alone, at times of the globe alone, and not rarely a combination of the two, possessing distinguishing physical features from all other forms of conjunctivitis; appearing with the advent of warm weather and disappearing with cold and repeating this peculiarity year after year. The physical appearances are:

I. LESION OF THE PALPEBRAL CONJUNCTIVA.

"(a) The most constant, and perhaps the pathognomonic symptom is a peculiar bluish white, milky appearance of the tarsal conjunctiva. Vetsch was the first to describe this condition, which is present in a greater or less degree in nearly all cases. In the few instances where it is not present the conjunctiva appears dull, infiltrated and thickened.

(b) The surface of the thickened conjunctiva may be smooth; usually, however, there are a number of elevations which present a striking appearance, resembling the granulations of no other form of conjunctival disease. These elevations present a pale pinkish, waxy appearance, and are quite flat, resembling plaques with crevices between. They are situated on the tarsus, the fornix being free, and are usually thickest in the middle of the lid. They are slightly pedunculated.

(c) In another and smaller group of cases the granulations are not so flattened, are yellow, semi-transparent, and cover more of the conjunctiva of the lid. These bear a close relationship to the granulations in follicular conjunctivitis.

In all three types the upper lid is the most affected, the conjunctiva of the lower lid being rarely more than thick-

ened, with but a few elevations on it. The granulations are hard and gristly, this being especially true of the more rounded variety. A watery or mucous discharge is more or less constant, rarely it becomes mucopurulent, but never purulent.

II. LESIONS OF THE OCULAR CONJUNCTIVA.

(a) The limbus of the cornea becomes thickened and encroaches upon the cornea, forming a narrow ring of grayish yellow opacity, which encircles the cornea. The inner edge of this zone is sharply circumscribed; the outer blends gradually with the surrounding tissue. This area of infiltration does not show any tendency to broaden and invade the central portion of the cornea, or to break down into ulcers.

(b) Large yellowish red elevations, more or less circumscribed, appear at the limbus in the palpebral fissure, either on the nasal or temporal side, or on both. These are usually somewhat triangular in shape, but may be oval or quadrilateral. When the former, the base of the triangle is situated at the limbus, and is sharply defined from the corneal tissue, while the apex blends gradually with the episcleral tissues toward the equator.

(c) Under this class is included a combination of the first and second forms; in this type the entire limbus of the cornea is thickened and occupied by a series of irregularly rounded warty like tumors, grayish yellow in color. The inner edge of the zone of infiltration is not so sharply defined as in the two preceding types, and at times the corneal tissue is encroached on to a considerable extent. No case has been reported, however, where this was sufficiently marked to affect vision.

(d) Ordinary saturated ulcers of the cornea, which sometimes result from pressure and irritation, occasioned by unusually large and hard granulations in the palpebral conjunctiva. The tumors or elevations which surround the cornea are like the granulations in the conjunctiva of the lids, hard, dense, and as a rule non-vascular. They are not painful on pressure.

It is extremely rare that the disease occurs in the typical form, exhibiting the characteristic lesions of the tarsal

and bulbar conjunctiva at the same time; though even in those cases where the elevations are most marked on the bulbar conjunctiva, there is usually at some time or other during the course of the disease, at least the milky haze, if not the characteristic granulations, on the tarsal conjunctiva."

As regards the etiology it is usually possible to exclude syphilis, scrofula, rickets, gout and a general neurotic condition, nor is it secondary to local inflammations elsewhere as in the nose and throat; mention is made of the relation of vernal conjunctivitis to recurring skin eruptions, all races and all grades of society are apparently equally susceptible. High temperature and high barometer are found to be most distressing to subjects of the disease. Until the morbid entity of trachoma and vernal conjunctivites are discovered, the relationship between the two diseases can not be denied and there is no evidence to support the theory of an association with phlyctenular keratitis.

Terson gives a resumé of the histological changes seen by various observers and agrees with Redmond "in holding that the epithelium, although proliferated, does not constitute the mass of the neoplasm but that the granulation is really a proliferation of the conjunctival tissue itself, with the increase in the number of elongated and narrowed cells, and also of embryonal and round cells."

The histological changes differ somewhat in the pericorneal and tarsal forms "thus in the former he found a thickened epithelium of stratified pavement cells of a greater number than normal, but without the invagination noted by most authors; there was no well defined basal membrane; the tissue contained vessels, dilated capillaries and lymphatics, but was lacking in cells; the conjunctival cells were flattened and fusiform, and were compressed between enormous bands of fibrous connective tissue. In addition to these changes, he observed that the tarsal granulations are provided with an epithelium which is less abundant, though of the same nature, and without epithelial invaginations, the mass of the tissue being equally fibrous, though the infiltration with round cells and with leucocytes is much less marked. In this

class of cases there is a proliferating tarso-conjunctivitis, a true papilloma of the tarsus, greatly hypertrophied and proliferated with elements which are newly formed and without the enormous lymphatic nests of trachoma. It was noted that in the tarsal variety the epithelial proliferation is less important than in the pericorneal, and that the typical granulations are formed by the subepithelial tissues.

Terson concludes finally that, as a mark of differentiation from the granulation of trachoma and the pustule of phlyctenular disease, the vegetation of vernal conjunctivitis is indurated, and he regards it as being really an attenuated papilloma which does not attain the composite structure and full development of the true form.

From the study of sections of the tarsal conjunctiva taken from three cases the writer found a dense fibrous tissue beneath the epithelium which had apparently occasioned the elevations. The epithelium between the contiguous elevations could be seen to dip down below them in finger-like prolongations from the surface. Sections made parallel to the surface showed a network of epithelial cells with the spaces in it filled with dense fibrous tissue, each patch of fibrous tissue having a central blood vessel."

The disease usually begins, like an ordinary attack of catarrhal conjunctivitis, with smarting, burning and lacerimation, though an annoying itching sensation in the lids is apt to predominate. These symptoms persist with remissions during the course of the disease, being aggravated by hot murky conditions of the weather and ameliorated on dry and cool days.

The onset is usually with the first warm weather in the spring and lasts until cool weather in the fall.

In atypical cases the diagnosis is not always easy except by exclusion, in its typical form it is easy of diagnosis.

The writer sent a circular letter to the ophthalmologists throughout the United States with a view of ascertaining their experience in studying and treating this rare form of disease; the answers showed that vernal conjunctivitis was prevalent in the proportion of about one to every 200 to 500 cases of conjunctival disease; that it is not increasing in frequency; the palpebral type is most

common, 60 per cent., the associated form next, 30 per cent., and the ocular form least common or 10 per cent. The elevations in the conjunctiva are more common than the thickening of the conjunctiva; both lids are as a rule affected; in about 7 per cent. of cases the disease was limited to one eye; the age limits are from 18 months to 50 years, males are more subject than females, 85 per cent. as compared to 15 per cent., it is questionable whether there is any connection between vernal conjunctivitis and diseases of the nose and throat; it is not considered contagious; it may be sometimes hereditary.

In the treatment nearly every thing in the ophthalmic materia medica has been tried as well as operative procedures but weak astringent washes with occasional massage with yellow oxid ointment give the best results. Constitutional treatment should be directed toward the disturbance. Adrenalin is found to relieve the intense itching, and iced compresses and lotions are to be used in the first attack.

Subtropical Trachoma With Special Relation to a New Remedy in its Treatment.

WRIGHT, RUFFIN A., Mobile (*Jour. Amer. Med. Assn.* Aug. 8, 1903), finds the type of the disease in his locality in milder form, less frequent in the more serious complications and less disastrous in its final results. He has never seen a case of true trachoma in a negro.

The disease is becoming more prevalent in his section.

Attention is called to the use of copper citrate in the treatment of trachoma and while "it does not cure trachoma more quickly than other non-operative methods" it has given very good results in his hand. It is used in the form of an ointment in 3 to 10 per cent. strength.

Treatment of Trachoma.

CLAIBORNE, J. HERBERT, New York (*Med. Record.* Aug. 8, 1903), considers both the non-inflammatory and inflammatory form. All treatment is medical or surgical, and all of the known remedies that are astringent have been employed. Inoculation with gonorrheal pus, "this barbaric and criminal form of treatment," has been

abandoned. Jequirity "should be employed, if ever, only in those cases in which there is dense pannus and keratitis. . . ." "To-day it may safely be said that the use of the abrus precatorius bean no longer plays a role in the treatment of trachoma." (These statements would seem to need some modification in view of recent experiences with jequiritol, and the application of immunizing serums and anti toxins to the dosage of this drug, P. H. F.) Silver nitrate is of but slight value in the treatment of real trachoma. Zinc, as a palliative and supplement to severe measures is to be commended. Copper sulphate stick stands pre-eminent. It should be ground smooth, and "so thin that it can be introduced under the upper lid without undue force or traction.

Surgical treatment is most brilliant in the first stage—that with sago-like grains. Grattage—brushing or scratching the granules—with or without preliminary scarification, galvano cauterization, electrolysis after scarification, excision of the fornix fold, curetting of the granules, abscission of follicles, have generally been abandoned. Expression, described by Cinquet as early as 1873, performed with the finger nails by Hotz, has been improved by the inventions of Prince, Noyes, and Knapp. The latter's "roller-forceps" have been modified but not improved by Campbell, and by Rust. The author presents an instrument differing from Knapp's in that "the cylinders instead of being fluted have parallel lines of roughened elevations or nodules upon them, so that in rolling they not only express the material but also rupture the surfaces of the granules and allow of easier expression. In another form "the horse shoe (stirrup?) containing the rollers has been bent to a right angle to the handle. "This is an advantage in getting into the inner and outer canthi; the hand being out of the field of operation. Ether, preceded by ethyl chloride for two or three minutes, is the best anesthetic. Aftertreatment consists in zinc or acid boric till the post operative membrane is gone, then weak silver nitrate for a few days.

The second form (Egyptian or military trachoma) is best treated medicinally, "except when the granules are distinct and definite, whether discrete or confluent, and it has long been my custom to express these cases as long

as I could see any granules at all." When the lid has become cicatrized, blue-stone is the remedy par excellence. Iritis is extremely rare in trachoma, and atropine which is itself an irritant should never be used unless there is unmistakable evidence of that complication.

Amber Yellow Glass in the Examination and Treatment of Eyes.

SEABROOK, H. H., New York (*Medical News*, Aug. 22, 1903), finds that green best protects the eyes from heat, but imperfectly from blue rays, and diminishes the light. Yellow, as obtained through amber—yellow glass, gives but little protection from the heat rays, but almost perfect protection from the chemical rays without impairing vision, while it corrects chromatic aberration, centrally and peripherally and softens dazzling reflections "with this lens there is less congestion, lachrymation, photophobia and pain in examined eyes than without it; it is therefore, suitable for examination by the oblique method of lesions of the cornea, iris and ciliary body. "The effect on vision was improvement in over 35 per cent., diminution in less than 5 per cent., no change in 60 per cent. Adjustment of the new color values takes place after a few moments wearing of the glasses which have been found beneficial in asthenopia and ocular neuralgias, superficial keratitis central and peripheral, incipient cataract, post-operative iritis, and, particularly" in that class of cases having diminished vision and hyperesthesia of the retina, as occurs with glaucoma or tobacco amblyopia, relieving the irritation caused by light and improving vision. The author believes that "selected light," not necessarily yellow may prove of service in summer conjunctivitis in which there is photophobia with lachrymation. The irritation seems to be kept up by various forms of dust, or by bright light, but it is by no means sure that the heat rays are not a contributing cause. Amber yellow glasses are well worth trying for these eyes.

The Influence of Heredity on the Eye.

WEEKS, T. E., New York (*Med. Record*, Aug. 8, 1903), gives a somewhat cursory synopsis of this subject. The

form, the color, peculiarity of movement as well as the deep tissues of the globe are largely influenced by heredity; the tendency being increased by consanguinity. Among the affections most commonly seen are ptosis, epicanthus (Mongolian fold), coloboma of the iris and chorioid, aniridia, albinism, zonular and lamellar cataract, retinitis pigmentosa with and without pigment, and glaucoma. "By far the most common disease of the eye due to heredity is syphilis. The transmission of faults in the shape of the eye, whereby the various errors of refraction recur in the offspring, is not unusual. "Muscular anomalies, particularly the various 'phorias, are not infrequently transmitted. Color-blindness of all degrees is also strongly influenced by heredity."

Influence of Consanguinity on the Organs of Special Sense.

DEAN, LEE WALLACE, Iowa City. (*Jour. Amer. Med. Assn.*, Sept. 12, 1903.) The eye presents the greatest possibilities for exact investigation as here are blood vessels and a nerve with its end organ exposed.

The writer reports 9 cases of his own and gives two cases reported by others, all having greater or less amount of eye complication with a history of consanguineous marriages.

Of 181 blind children in the Iowa College for the Blind in 1900, 9, or about 5 per cent., were the result of consanguineous marriage of the first degree. The number of consanguineous marriages of the first degree in Iowa is far below 0.5 per cent.

If we exclude from the list those blind children who were blind because of blennorrhoea neonatorum, sympathetic ophthalmia, trachoma, etc., and consider only those who suffered because of congenital conditions, we would find that 14 per cent. were the result of consanguineous marriage of the first degree.

Two factors may enter into the production of many of these conditions: 1. The eye is really an outgrowth from the brain, and is consequently subjected to the same conditions as the central nervous system during its development. 2. The eye is changing, and an organ that is adapting itself to new conditions is more liable to malformation than one with a constant condition. The socket

is becoming less deep and the superciliary ridges less marked.

A number of interesting things are suggested by these cases: 1. The relation of the inheritability of a condition to its production by consanguineous marriages. I would judge from these cases that the greater the inheritability of a condition the more liable it is to be the result of consanguineous marriages. Theoretically, this would also be the case.

2. It is interesting to note that where there is an arrest in development, as in the cases of microphthalmos, coloboma of the iris, congenital cataract, and anophthalmos, the eyes are in an opposite state to those of eyeless fishes and worms where they have been lost by disuse. Wagenmann has found that the lens and the retina were almost the least of the structures acted on, and that the phyletic degeneration does not follow the reverse order of development. The eye does not resemble part embryonic conditions as in the eyes where there is an arrest of development. At birth the eye is almost normal, but, with age it degenerates. The microphthalmic eye improves the first ten years after birth, owing to a diminution of the hyperopia. A third point in connection with these cases is the resistance after operative procedures. Dr. Gruber of London writes me that he has operated on a number of such eyes with good results. I have never seen any serious sequelæ following an operation. While there is an arrest of development, the nutrition is apparently normal.

As to the influence of consanguinity on the neuro-epithelioma, I would certainly not express any opinion. I simply mention the case as I found it while conducting my investigations.

Concerning a Possible Etiological Factor in Tobacco-Alcohol Amblyopia Revealed by an Analysis of the Urine of Cases of this Character.

DE SCHWEINITZ, G. E., Philadelphia, and EDSALL, DAVID L., Philadelphia (*Amer. Jour. Med. Sciences*, August, 1903), attempt to throw light on the nature of the possible poison which produces those changes in vessels, connective tissue and nervous elements of the optic nerve and retina which in their turn interpret themselves by the

clinical symptoms of this well known form of amblyopia.

The method of study adopted was to submit the urine of patients to a thorough analysis, to regulate the diet according to the findings until the normal standard in the excretions of the body was reached, and to note the effect of such treatment upon the amblyopia. The results in all cases (seven) show in general that there was an excessive excretion of enterogenous decomposition products in the urine, with more or less marked urobilinuria. In all the patients repeatedly examined these abnormalities nearly or quite disappeared under treatment, coincidently with improvement in the eye-conditions.

In these cases there were evidences of a marked disturbance of digestion or of metabolism, or of both; furthermore, this disturbance may persist for a long time after the use of alcohol or tobacco has been stopped, and it appears that treatment of this secondary nutritive disturbance will cause improvement in a persistent amblyopia. This view agrees with the results of investigations concerning the manner in which other toxic effects of the alcoholism are produced, and it also accords with our knowledge of the effects of some other chronic poisonings. There are, for instance, excellent reasons for the belief that many of the cerebral and other nervous symptoms in lead poisoning are not due directly to lead itself, but to nutritive disturbances set in motion by the lead. In some of the cases described there was disorder of the liver with enlargement and tenderness of that viscus, besides marked urobilinuria.

On the Toxicity of Methyl Alcohol in Extracts and Medicines.

MAIN, R. H., Barry, Ill. (*American Med.*, Sept. 5, 1903.) Another case of blindness followed by death from methyl alcohol is reported; the deceased, a watch tinker, an inebriate, was 44 years of age and being unable to obtain whiskey drank lemon extract for several days. On Feb. 17 in the morning his sight began to fail and he stopped drinking. On the morning of Feb. 18th, central vision was gone but he retained some peripheral vision and by noon he was blind and he died at midnight. The cases reported of blindness and death from drinking methyl

alcohol or extracts containing it are tabulated and the paper summed up.

"1 That methyl alcohol is an active and dangerous poison.

2 That it is capable of producing and has produced in numerous instances death and permanent blindness even when taken in small quantities (Burnett 5.6 cc., dram .11/2—Raub 7.5–18.5 cc., dram 2–5).

3. That it is used extensively in substitution for grain alcohol and in the manufacture of extracts, spirits, and medicines, intended for internal use and that its use is not suspected by the consumer.

If, in the face of the evidence presented to us daily, anyone should deny its toxicity we may certainly be justified in considering him beyond the reach of argument.

The use of methyl alcohol has proved lucrative and so long as that is so it will be used extensively. A series of what are called facts are produced to prove its harmlessness but the cases of blindness and death give them the lie. If it is not poisonous, I see no reason why it should escape a federal tax.

I will close with the following suggestions to our Pure Food Commissions and Boards of Health.

1. To require every manufacturer to publish on every package the formula of the preparation as is done in England.

2. To prosecute every one failing to do so.

3. To recommend a federal tax on methyl alcohol so that its substitution for ethyl alcohol will not be profitable"

Cystotoxins and Sympathetic Ophthalmia.

PUSEY, BROWN, Chicago. (*Archiv. Ophth.*, July, 1903.) Reasoning from the analogy of "Pfeiffer's reaction" and the production of hetero- and iso- toxins and their results, the writer suggests an hypothesis for the causation of sympathetic ophthalmia, i. e., "a damaged eye degenerates in the orbit, the cells of the eye (probably the lining cells of the ciliary processes and the iris) can give rise to a specific cystotoxin, which, circulating in the blood, picks out the cells of the fellow eye, and may cause changes

which we now designate as sympathetic ophthalmia.”

The writer carried out an experiment on the above hypothesis but without result.

[This suggestion is somewhat similar to that made by Dr. H. Gifford in a paper “On the History of the Theory of Sympathetic Ophthalmia” (*Archiv. Ophth.* Nov., 1902) and reviewed in these ANNALS (Jan., 1903, page 110), i. e., “but it may be that various species of microbes after growing within the eye for several days or weeks, may by a process of natural selection, acquire a certain specific adaptation to the uveal tract, so that, on being carried to the second eye by the blood current, may find there conditions most favorable to their development.”—Reviewer.]

Treatment of Atrophic Retinae With Retinal Extract.

DOYNE, ROBERT W., Oxford (*Brit. Med. Jour.*, July 25, 1903), observing marked temporary improvement of vision in a patient with retinitis pigmentosa who had vomited frequently on a sea trip, reasoned that it was possible that the violent straining caused by the sickness might have forced more blood into the retinal vessels in the same way as into vessels of the head and neck, as evidenced by the intense congestion observed in such cases. “Amyl nitrite, the recumbent position and red glasses which the author claims are less exhausting to the retina suggested themselves as therapeutic measures in line with this theory.

Realizing that in these cases the retina is as it were starved by the diminished blood supply through the contracted vessels, and wondering if any good would result by charging the blood more richly with the retinal constituents, and so compensating for the limited supply. “Doyme tried feeding with raw retinae of sheep and oxen, giving from six to nine daily. The tissue degenerates very rapidly and there is great difficulty in getting it fresh from the slaughter-houses. Experiments were made to secure an extract, which has been put on sale as “optocene” by a London firm and “seems to have all the value of fresh retinae.” The cases in which marked improvement was noted were retinitis, pigmentosa, retinal degeneration in high myopia, and in chorioiditis and tobacco amblyopia. While recognizing the psychical elements especially that of

suggestion in any form of treatment, D. finds one thing clear, "that there is actual improvement in function. . . ." A patient, who eventually gained a striking improvement, explained early in the course of treatment that though she did not seem to be able to read more or smaller print, yet that it looked much blacker, whereas formerly the ink looked so pale that at times she could hardly distinguish it from the paper.

Four cases of tobacco amblyopia were able within fourteen days to read small print quite readily although they were not well. The author promises to enter into the technical details of the series of cases in another communication.

The Need of a Supplementary Lantern Test for the Proper Examination of Color Perception.

WILLIAMS, CHARLES H., Boston (*Boston Med. and Surg. Jour.*, July 30, 1903), claims that extended use of the Holmgren test by many examiners shows some cases able to pass this test without hesitation, who when examined with the lights from a distant signal, may be unable to distinguish the red or green with certainty, and often confuse these colors. This occurs most frequently in toxic amblyopia where the macular defect is so small that the retinal image of the skein of worsted falls partly outside it on normal perceptive elements. We must have a supplementary test resembling as nearly as possible the conditions of service and of such a kind as to show conclusively, after the test has been made, whether the person can be relied on to recognize quickly and accurately the color of a distant signal light.

The author presents an improved model of his lantern having on its face a single disc with eighteen colored glasses, and within the lantern two lights and a shutter, so arranged that either two or one of the colored glasses can be illuminated at one time. The shutter also changes the area of the lights. The lights are designated by numbers seen only by the examiner and used for purpose of record. The area of the largest opening, at a distance of twenty feet, corresponds to the apparent size of a standard switch-light at 160 feet; the smallest, to such a light at 1,300 feet. Using an electric lamp with a

rheostat, the intensity of the illumination can be varied by fixed amounts. The lantern is already in use on the Canadian Pacific, Northern Pacific, and Southern Pacific railways, the older model still being used by the N. Y., N. H., & H. R. R., the Great Northern, the Boston & Maine, the Canada Atlantic, and some other roads.

A Signal Test for Color-Blindness.

FRIDENBERG, PERCY, New York (*Med. Record*, Aug. 1, 1903), sums up the objections to the Holmgren test as follows: In the first place there are many cases of rejection for color-blindness which later examination proves to have been unjustified, while cases of color-blindness have been discovered after the person has passed the test. Railway and marine surgeons who use a test with colored glasses in addition to the wool-test constantly report the discovery of cases by the one which have successfully passed the other. An ideal test would consist of an immense number of colored lights under all the variations of brightness, distance, fog, etc. The person tested should be required to name the colors. This is just what he does in thinking about the lights he sees when at work; he decides that this one is "red," that one is "green," etc. The judgment of the likeness or unlikeness of colored objects is an utterly different form of mental activity.

The author's lantern is intended to reproduce service conditions on a diminished scale. The glass for the signal light is made of standard red, green, blue, yellow, and purple as supplied for switch-lights on one of the largest railroad systems of the country. The lantern is in the form of an asbestos chimney like those used for retinoscopy. It may be lit up by a candle, or slipped over the glass chimney of an argand burner or the bulb of the incandescent electric light. A disc containing apertures ranging from one to twenty-five millimeters in diameter allows quantitative variation corresponding to distance, and a series of ground and "London smoke" glasses produces changes like those due to smoke, fog and snow. A spring shutter large enough to cover the biggest aperture allows the signals to be exposed instantaneously, if desired, and thus to test macular color perception.

Asthenopia Dependent on Neuresthenia and Hysteria.

GRADLE, H., Chicago. (*Archiv. Ophthalm.*, July, 1903.) The writer describes normal asthenopia as those cases having "a variable amount of H., not rarely up to 1.5 D, and exceptionally even to 3 D, which is tolerated without complaint until the accommodation proves insufficient for near work." This normal asthenopia is much exaggerated in anemic conditions and especially in neuresthenia and in many cases there is no ametropia only a low grade of catarrhal conjunctivitis or a blepharitis. These patients do not respond to corrected refractive errors or treatment directed to the eyes but must be dealt with constitutionally.

Hysterical asthenopia is a decided exaggeration of the above type; usually demonstrated by the patients detailed and emotional description of the suffering. Mental therapeutics are the only remedies that can be successfully employed.

Skiascopy as a Method of Precision.

JACKSON, EDWARD, Denver. (*Jour. Amer. Med. Assn.*, Sept. 5, 1903.) "So many points must be attended to if we would render skiascopy a method of precision, and so interdependent are they, each losing most of its value when not used in connection with the others, that it seems proper to recognize a special form of the shadow-test as exact skiascopy. This we can do while fully appreciating that in essential theory and general character it is identical with the shadow-test in general.

We would indicate by the term exact skiascopy:

The working at a distance of one-quarter to one-half meter.

The accurate measurement of the distance.

The adaptation of the source of light and the sight hole to this distance.

Care to bring the source of light close to the conjugate focus of the retina.

Means of fixing exactly the direction of the principal meridians.

Control testing, by departure both ways from the lens, strength, focal distance, or meridian fixed on.

And, in general, precision and exactness in every detail.

Such a method of examination is capable of sufficient accuracy for ordinary practical purposes. It will fix the error of refraction within one-quarter diopter, and in many eyes within one-eighth diopter, and the direction of astigmatism within 5 degrees when the astigmatism amounts to 0.75 D. or over, and within 15 degrees when it is only 0.25. D.

In recognizing the fact that skiascopy will not determine the refraction of all eyes with equal accuracy, it must be remembered that this is true of all methods of measuring refraction, and most true of those that give the most exact results, especially the subjective test with trial lenses and test letters.

It is not admitted that skiascopy is in this respect inferior to other methods. As a matter of fact, it can be relied on more completely than any other method now in use."

Cramp of the Ciliary Muscle Due to Eye Strain.

WRIGHT, JOHN W., "Columbus. (*Jour. Amer. Med. Assn.*, Sept. 12, 1903.) 1. An emmetropic eye may have cramp of its ciliary muscle. Too much near-work leads to it. Impairment of the general health will augment it, but the cramp may exist in an emmetropic eye when there is good health from too much near work.

2. The ametropia conduces to it, especially hyperopia and astigmatism, whether hyperopic or myopic. In mixed astigmatism there is great predisposition to the cramp with a tendency to headaches and eye pains. This may be attributed to the unequal contraction of the sphincter fibers in order to obtain a clear retinal image. If, however, there is an excessive amount of near-work to perform, or there is a general impairment of muscular tonicity, although the refraction may be normal or made so by correcting lenses, the ciliary muscle is liable to become cramped from the excessive effort to contract."

If the eye is hyperopic or astigmatic, with these conditions existing, then the ciliary muscle must become inordinately contracted in its effort to perform but an ordinary amount of work. If the eye is myopic and uncorrected, the ciliary muscle, not being called on to perform much service

for near work, soon loses its tonicity for want of action; for this reason should an exigency require that the myopia be corrected to facilitate distant vision, the patient is unable to accommodate for near-work, or if so very reluctantly and ineffectively. The weakened condition of the muscle, rendered so for want of use, readily conduces to cramp.

In high degrees of uncomplicated and uncorrected myopia there cannot be cramp of the ciliary muscle, but it is found in low degrees of this refractive condition and in high degrees, where full, or quite full, correcting glasses are in use. If myopia is corrected early, the ciliary muscle may regain its normal functions, and is then liable to become cramped from overwork, as does that of the emmetropic eye.

The writer while believing in hypertrophy of the ciliary muscle, says it is a distinctly different condition from ciliary cramp. "The cramp of a muscle is an evidence of its weakness. After the protracted contraction of a muscle, the tendency is to keep more or less contracted, and when through necessity it must relax, pain accompanies the effort. Cramp of the ciliary muscle is not constant, although the conditions which produce it may be present. As before stated, it may occur in an eye whose refraction is normal, simply because the eye is overworked. One of the first symptoms of ciliary cramp, aside from headache and pain in the eye itself, is that vision for distance is variable. At times the patient may have good distant vision, but on the least exertion at near-work the cramp returns with great severity, and the patient suffers accordingly. It is this tendency of the ciliary muscle to return to its old condition of contracting that gives the oculist so much concern after he has properly fitted his patient with glasses."

The treatment consists of transient cycloplegia; one drop of a solution of 1 per cent. homatropin and 2 per cent. cocain is instilled into the eye on retiring. If there is also persistent headache the following prescription:

R	Morphia Sulph.	0	065
	Liq. Potass. Arsenitis		
	Tinct. Gelsem. (Green Root)	aa	4 00
	Elix. Simp.		
	q. s. ad.	120	00

M. ft. Sol.

Sig. Teaspoonful each six hours until headache ceases.

Causes and Prognosis of Sudden Blindness.

VAN BEUSCHOTEN, G. W., Providence (*Med. Jour.* July, 1903), enumerates the following affections. Embolism of the central artery of the retina, or thrombosis of a vein. Blindness comes on instantaneously, is almost invariably muscular, and if the embolism is complete, is absolute. If only one of the branches of the artery is occluded, the complete (?) loss of vision may be only momentary. Upon examination an anemic retina is found with small and empty arteries. The veins are lessened in calibre, and the blood stream stationary in peripheral vessels. The nerve head is pale (nothing is said of the characteristic appearance at the macula. P. H. F.). Thrombosis of the veins present opposite appearances.

Hemorrhage into the retina and vitreous is the most frequent cause of sudden partial loss of vision. The latter varies with the size and location of the clot. In small hemorrhages rapid improvement may follow complete blindness. Violent physical exertion is the usual cause: weakened blood-vessels (atheroma, Bright's, etc.) the predisposing factor. Diffuse haziness of the vitreous offers a worse prognosis than small hemorrhages with a clear one.

Copious loss of blood may cause sudden blindness which not infrequently persists. The prognosis is better when the blindness comes on at once than when several hours or days intervene. In the latter case optic atrophy is common.

Uremia is a cause of blindness which is usually binocular. The vitreous may appear normal while retinal hemorrhage and other signs of albuminuric disease appears.

Spasms of the retinal vessels with blanching (commotio) of the retina cause sudden blindness, which is monocular, traumatic, not complete, and followed by prompt restoration of sight in a few minutes (?) or hours.

Detachment of the retina or a further detachment of an already loosened retina may cause sudden blindness.

Sudden blindness from hysteria is rare, usually develops gradually with a concentric, progressive narrowing of the visual field.

Sudden blindness occurring during the course of an acute infectious disease is rare and may usually be traced to uremia or nephritis. Possibly it is sometimes due to the administration of drugs.

The Prominence of the Eyeball and a Method for Measuring it.

JACKSON, EDWARD, Denver (*Am. Journ. Med. Sci.*, July, 1903), has devised a simple wooden rule shaped like a banjo bridge, to measure such prominence. Its curved side is pressed against the face, the straight edges resting on the outer margins of the orbits, its upper surface just in the plane of the visual axes, the eyes being directed horizontally toward a distant object and the head held erect. There are parallel lines 1 mm. apart on the upper surface of the rule along which the observer sights from the right or left of the patient, according as he wishes to determine the prominence of the right or left eye. The fixed point of reference used is that in which a plane through the visual axes of the eyes, when in the primary position, intersects the outer margin of the orbit. This point is very nearly the most retreating portion of the outer orbital margin, is easily determined on the normal face or on the bare skull, has the least variable relation to the apex of the orbit and to the more important landmarks of the skull (Liebreich claims that this is not so. P. F.), and has a comparatively thin covering. The line joining these corresponding points of the two orbital margins constitutes a base line from which the prominence of the eye ball is to be measured.

Paralysis and Paresis of the Muscle of Accommodation.

SUKER, GEORGE F., Chicago (*Am. Jour. Ophthalm.*, July, 1903), reviews the history and advance of knowledge in regard to the function of the ciliary muscle and the mechanism of adaptation for varying distances, and its disturbances.

When the ciliary muscle or nerve is involved we have an active form (myopathic, neuropathic) which may be due to a peripheral, nuclear, or orbital lesion. The passive form involves the lens or zonule alone. Paresis is more often peripheral (myopathic) than nuclear or orbital, while paralysis is apt to be a nuclear or a peripheral nerve lesion.

In diagnosis, the range of accommodation characteristic of the age of the patient must be considered. In the aged absolute paralysis of the ciliary muscle may be present and yet no recession of the near point take place. In the young any defect in its contraction at once becomes manifest. Paralysis presents symptoms diametrically opposed to those of spasm, while paresis simulates asthenopia. The subjective disturbances are greatest in hypermetropes, least in "brachymetropes" (!?) with myopia of three or four dioptries and no glasses. The annoyance is slight if but one eye is affected. Micropsia is a frequent accompaniment. The etiological factors are syphilis. This includes tabes, in which the ciliary muscle is often the first that suffers. The paralysis is usually bilateral and accompanied by either partial or complete mydriasis. In brain syphilis an early involvement of the accommodation centre has been noted, but it is more apt to affect the extrinsic eye muscles. The prognosis is bad.

Sympathetic ophthalmia may become manifest at a very early stage in the sympathizing eye by ciliary muscle paralysis. It is a peripheral lesion, as is the accompanying moderate mydriasis, and is a neuropathic paralysis, possibly of a toxic nature. Local peripheral causes include diseases of the iris and ciliary body which produce exudates or organized inflammatory material binding down the accommodation muscle, glaucoma, injuries, especially those of the zonule, defective teeth and irritation of the superior maxillary nerve. Over-exertion and misuse of the eye, working over bright fires or intense electric light, shock and lactation are occasional factors. Poisons either local or general very often produce paresis. Among the former are mydriatics and allied groups. Meat, fish or vegetable poisonings produce a peripheral paralysis by ptomaines. Alcohol, tobacco, cocain and morphin, must also be considered.

Among systemic diseases, diabetes is a factor. The affection is probably toxic, improving with the decrease in the glycosuria. It may be nuclear and then unilateral (hemorrhage?). In influenza the paresis, as in diphtheria, may appear some time after the patient is well. It is rarely a premonitory symptom. The disease being of

germ origin, some toxin is probably the cause. The type is peripheral, nuclear implications being prone to occur when brain complications arise early in the disease. The prognosis is generally good.

Diphtheria is a frequent etiological factor, the severity bearing no relation to the frequency or severity of the paresis. The young and middle-aged share alike. It generally occurs during convalescence with sudden onset and two to three weeks duration. Recovery is the invariable rule, (?) and this without specific medication. No angina produces a similar paresis; the infection must have been diphtheritic when it follows a sore throat, or a wound anywhere. The attack is usually bilateral. "If the accommodation interference is associated with absence of patellar reflex, tabes may be very closely simulated." (!) Antitoxin does not abate the frequency of post-diphtheritic paralyses. Therapeutically it is "as good as useless." The paralysis is peripheral, and due to a toxin which effects the ciliary muscle.

In Hysteria spasm is more frequent than paralysis. Children furnish the largest quota of cases, and in them it is the first symptom of a general hysterical manifestation. Very few hysterical patients escape without accommodation interference.

Many of the infectious diseases as typhoid, malaria, pneumonia, scarlet fever, measles, pertussis, neurasthenia, scorbutus and multiple neuritis develop a paresis either during the attack or directly upon convalescence. It is myopathic and due to exhaustion of the ciliary muscle, probably from toxins. The affection is usually mild, and recovery rather rapid after the general muscular system has been toned up.

The anemias, particularly chlorosis are prone to ciliary paresis.

Rheumatism, gout and dysentery, and even involvement of the accessory sinuses of the nose may be factors. Tuberculosis "with all its disseminating tendencies rarely causes a paresis except that which may be due to muscular feebleness."

In treatment, the underlying cause must be considered first of all. The palliative treatment is the use of suitably adjusted lenses. Eserin or strychnia may do some good,

but it is probably only apparent. In general, the peripheral types offer a better prognosis than the nuclear or central.

Fusion Tubes and Their Use for Strabismus.

JACKSON, EDWARD, Denver (*Amer. Jour. of Ophth.*, Aug. 1903), has modified the Priestly Smith tubes so that they are more freely movable, adjustable to interpupillary distances, allowing fusion of vertically displaced and rotated images. The tubes are made one entirely independent of the other. One end of the tube is closed by a metal diaphragm, in which is a minute hole and a narrow slit. At the other end of the tube is placed a convex lens, having its principal focus at the diaphragm. One side of the tube is cut away or flattened, so the slits can be brought almost together. This allows fusion when the normal axes converge to a point as close as three inches from the eyes. When held with the flattened sides toward each other the two lines or the two dots can be fused but not both at once. If only one dot and one line is seen, but one eye is being used, if two dots and two lines, their is vision with both eyes but no fusion. With normal binocular fusion, one line and two dots are seen. The brightness of the line and dot seen by the better eye may be lessened by pasting one or more thicknesses of paper over them. After binocular fusion is secured, the tubes are moved as far as is possible without a separation of the images in a direction toward parallelism. Thus in convergent strabismus the convergence of the tubes would be diminished; in vertical strabismus they would be brought into the same horizontal plane, in rotary deviation, twisted until the slits are parallel, and so on. All these movements train the power of binocular fusion and give it control of the ocular movements. In teaching the child to see with both eyes at once and to pay attention to the images which both furnish, the tubes may be turned so that the lines appear parallel in an oblique position, cross at right angles, join at top or bottom, etc. The variety and freedom of such exercises prevent their becoming so quickly distasteful, as do those of the amblyoscope and stereoscope.

A New Portable Perimeter.

JAMES, J. T. BROOKSBANK, Lon., (*Lancet*, Aug. 1, 1903.) The instrument consists of .1. Two sliding tubes of brass uprights, one for the arc, the other with a chin-rest. 2. The arc, made of three pieces of aluminum tubing, forming a quadrant with a radius of 33 cm. 3. The test-object carrier consisting of a disc with an aperture 5 mm: square, behind which another carrier rotates. 4. A thin metal disc three and a half inches in diameter for the chart. The carrier itself is moved round the arc by means of a steel wire ten inches long in the observer's hand. The distance of the patient's eye from the fixation point is measured by means of a steel rod 33 cm. long which can be made to impinge on the patient's cheek when the chin-rest is to be dispensed with. The instrument is very useful for examining the visual field in patients confined to bed, fits into a wooden box, ten inches long, four and a half wide, and two deep,^f and weighs very little.

Report on the Operative Treatment of Grave's Disease.

WITHERSPOON, T. C., St. Louis. (*Jour. Amer. Med. Assn.*, July 25, 1903.) The failure of the different medicinal agents in this disease has lead to a host of remedies for its cure and as each new theory has been advanced as to its etiology a new method of treatment has been adopted.

"Iodin, strophanthus, veratrum viride, bromids and chloral, galvanism, thyroid extract, adrenalin, sodium phosphate, sodium salycilate, dietetic regulation, massage, the serum of thyroidectomized goats, the flesh and milk of these animals, and lastly, various surgical procedures, have each been advocated as most helpful."

"At the present time a certain degree of empiricism must enter into the treatment; our conduct toward these cases must rest to a large extent on our experience in the past. We must notice where the internist obtains good results, and weigh carefully the data he presents; likewise have we to consider the surgeon's side of the question, and noting here success and there failure, obtain an explanation of the different results by the different manners of operation, and the individual characteristics of the patients."

The author reports nine cases in which internal medication failed to give relief, and surgical interference being so satisfactory has led him to believe that these cases "are eminently surgical," but of course are "to be governed by those rules which are followed in advising operation on any part of the body for the various conditions which fall to the surgeon's hands. In the second place the symptoms which characterize Grave's disease must be given due consideration, and proper value placed on the conditions which characterize each individual case."

"A number of surgical procedures have been proposed. The injection of agents into the gland which tend to destroy its secreting power is dangerous, and should never be resorted to.

Ligation of the thyroid arteries to reduce vascularity of the gland has a warm advocate in Kocher.

Ligation of the superior thyroid is relatively easy, but the inferior cannot be gotten at through an incision in front of the sternocleidomastoid, except by luxating the gland upon the surface, in many of the cases. In selecting the vessels, attention will be paid to the amount of vascular degeneration of the different parts of the gland. It is rare that the whole gland is alike affected. Those vessels are ligated which best control the vascularity. The operation is simpler than removing the lobe, and is to be recommended in those cases where the symptoms remain intense after resting the patient. Later, however, this procedure should be supplemented by a partial thyroidectomy in the large per cent. of cases. The initial ligation always renders the removal of the lobe easier than where this is done primarily.

Unquestionably, the operation which gives the greatest degree of satisfaction is the removal of the most involved lobe of the thyroid gland. Very frequently this is the right. Why this should be so is difficult to understand. Many explanations have been given, but none satisfactory."

The operation should *always* be performed under local anesthesia. There is usually a great deal of hemorrhage which is controlled by ligating the superior and inferior thyroid arteries. Great care must be exercised to avoid injuring the recurrent laryngeal nerve, while dealing with the inferior thyroid.

“The results from operative treatment of Graves’ disease have been, on the whole, gratifying. Naturally, they vary somewhat with different operators, and also with the character of operation. Mortality has been surprisingly low; in 1896 Starr gave a record of 190 cases collected, with a mortality of only 12 per cent. Kinnicut the same year presented the record of 187 cases with 7 per cent. mortality. Schulz records 20 cases without mortality. The most valuable record of the present time comes from Kocher, of Berne, in which he had four deaths in 59 cases operated upon by himself. In these, the operation could not be held entirely responsible. Ligation in the past had a larger per cent. of mortality than thyroidectomy, but there should be no reason for this at the present time.”

“The relief of the symptoms of Graves’ disease has been gratifying. A fair average for the cures from operative procedures during the last ten years may be stated at 60 per cent.; of decided benefit 15 per cent.; and of deaths and failures, the remaining. In the seven cases surviving the partial thyroidectomy performed by myself, the symptoms in all practically disappeared. Betterment was noted in all but one within forty-eight hours. Nervousness in each case disappeared almost completely before leaving the hospital, with the exception of the last case operated on but a few days since.” “After the operation certain symptoms may continue for a longer or shorter time before disappearing. The most persistent of these is the exophthalmia. In my cases ocular co-ordination was one of the first noticeable benefits. The psychic disturbances which follow, I believe, may be attributed to an infection in the wound in the majority of cases.”

The Extirpation of the Lacrimal Sac—Its Indications and Technique.

KNAPP, ARNOLD., M. D., New York. (*Archiv. Ophthalm.*, July, 1903.) “Indications:—1. Chronic purulent dacriocystitis; if of some standing and antiseptic treatment has not succeeded in curing the suppurating character or if the sac is dilated. In this group of cases the great danger to the eye in possible corneal affections should not be lost sight of.

2. Repeated attacks of acute dacriocystitis with abscess.

3. Whenever the sac is dilated whether the contents can be expressed or not.

4. Lacrimal fistula.

Methods:—The anesthesia may be local or general, the local being only suitable in the absence of acute inflammatory conditions. The superficial cutaneous incision may be anesthetized by the ethyl-chloride spray or by the usual infiltration-anesthesia. Subsequently the parts can be rendered more or less insensitive by the local applications of a cocain solution, and in suitable cases it will be found of advantage to inject a weak solution of cocain into the sac before operation. The incision begins just below the internal canthal ligament and passes down and out along the prominent orbital margin from one and a half to two and a half cm. The ligament may be divided or not. If it should be divided care must be taken to carefully join the divided parts at the termination of the operation, so as to prevent a possible sinking in of the caruncle. The incision is carried through the subcutaneous tissue and the anterior fibres of the aponeurosis until the sac itself is exposed. This structure is usually recognized by its pale red or bluish-red smooth uniform surface.

Hemorrhage from the lower part of the incision is apt to be annoying, but can generally be thoroughly controlled by a suitable introduction of the retractors and by compression. The sac is then isolated by blunt dissection from its inner wall; proceeding upward the cupola is freed and the sac can be more or less lifted out of the fossa. The outer surface is usually more adherent and has to be separated by cutting. This can be easily done by a pair of small blunt scissors, the attachment above and outward to the two canaliculi being carefully separated.

The sac is cut off as low down in the lacrimal canal as possible and the canal is thoroughly curetted with a small spoon. With the aid of reflected light, after the edges of the wound are properly separated, a careful inspection is then made of the walls and the roof of the lacrimal fossa with a view of detecting any remaining islet of mucous membrane, granulations, inflamed periosteum, or carious

bone. These possible complications must all be properly met and radically treated. We must be especially careful to see that the top of the lacrimal fossa is perfectly clean. If the bone on the inner wall (lacrimal bone) should prove to be diseased and superficial curetting be deemed not sufficient, a free opening should be made right through this into the nose. This enables the removal of the diseased bone and also insures proper drainage, the opening entering the nose in the anterior part of the middle meatus just below the head of the middle turbinal.

The operation is concluded by the exact approximation of the wound edges with two or three sutures, and the cavity is obliterated by proper pressure, and this pressure must be kept up in the dressings for the next few days.

The difficulty and success of the operation vary with the amount of inflammation and adhesions present. Operation in the presence of an acute inflammatory condition is of course more apt to be unsatisfactory as far as smooth and rapid healing is concerned. Still I have found that, unless the abscess had thinned the superficial integument the attempt can be made to obtain primary union after extirpating the sac under those conditions. It may be necessary to keep the wound packed for one or two days and then to approximate the incision by sutures."

The Mental Derangement which is Occasionally Developed in Patients in Eye Hospitals.

KIPP, CHARLES J., M. D., Newark, N. Y. (*Archiv. Ophthalmology*, July 19, 1903.) Twelve cases are reported, ten of which were cases of surgical operation on the eye or traumatic injuries; two were transient mental aberration in which the patients were being treated for disease of the eye.

"All of the cases reported occurred in the wards of the eye hospitals. Some occupied darkened rooms, but the great majority were treated in well-lighted, cheerful rooms; some were in a room by themselves but the majority had been in rooms with three or four others. Some were confined to bed, others were dressed and were sitting up and walking about the wards. Only one had both eyes bandaged at time the mental trouble developed. All the others had either only one eye covered by a shield or

had both eyes open when the first symptoms of mental trouble showed themselves. Some had good sight in the uncovered eye, the others had more or less impaired vision in it. Some came from our city, but most of them from some distance. Both sexes were represented, but males predominated.

My youngest patient was about thirty years of age, the majority were over fifty. All were in good general health, and were not suffering pain in their eyes when the outbreak occurred. All were mentally sound when admitted, and also of average intelligence. All were poor, some of them paupers. Most of them could talk English, but some of them could not speak any language with which the nurses were familiar. Most of the cases had been in the hospital more than a week and some only a few days when the mental trouble began. In most of the cases the delirium developed after operation on the eye, but in two no operations had been done and had not even been proposed to the patients. In the great majority of cases a solution of atropin had been instilled several times daily, but in a few no mydriatic of any kind had been used before the outbreak. Recovery from the mental trouble resulted very speedily in all cases in which we could return the patients to their former homes immediately after the outbreak. A considerable improvement was secured by having the members of the household stay with them and transferring them to other quarters. In the cases in which the patients' injuries resulting from the attempt to escape were so grave as to require their transfer to the general hospital, the shock or perhaps the change of environment produced a cure of the mental disease. With regard to the previous habits of these people, I have no reliable information; some of them were undoubtedly what are called moderate drinkers, none were drunkards, however, and a number of them were total abstainers from the alcoholic drinks; of this I have positive knowledge. In every case in which it was ascertained that the patient was accustomed to drink alcoholic beverages, small doses of alcohol were given several times daily during their stay in the hospital."

The writer believes that the cause of delirium is largely psychical, and he agrees with Parinaud that it is due to

the pre-occupation upon the part of the patient prior to and after the operation. What other features are, which in addition to the pre-occupation determine the delirium, are as yet unknown. The frequency with which the delirium is encountered should, however, be recognized and proper treatment—namely, chloral and bromides—be administered at its first appearance. The removal of the bandage from the unoperated eye and the discontinuance of the atropin are not advised. Constant oversight and judicious tactful nursing are most essential, and rapid amelioration of the mental condition follows the installation of a proper nurse by the bedside.

The impression which these cases have made upon me, is that these psychoses were the result of a change in the patient's environment and to an increasing longing to get away from the new surroundings. This view seems to me to be supported by the fact that all signs of mental disturbances passed away as soon as the patients reached their former homes, or were much quieted, if not entirely restored, by the presence of members of the household from which they came.

I may mention here that, although I have treated and operated cases at their own homes, I have never observed mental derangement in this class of patients.

I call it a homesickness, nostalgia, which ends in a form of melancholia with homicidal and suicidal propensities.

In the treatment of these cases I have never resorted to mechanical restraints, but in the future I shall not hesitate to resort to it when circumstances prevent the immediate removal or return of the patients to their homes. The very serious injury which some of my patients sustained in the delirium, and the danger to which the attendants who watched them were often exposed, would doubtless have been prevented if I had resorted to such measures. The use of hypnotics is of course indicated, but often very large and dangerous doses are required to quiet the patients. Many of them, moreover, absolutely refuse to take medicines and food and drink by the mouth, as they fear they contain poison. In such cases only remedies can be employed that can be given hypodermically. But the quickest way to restore mental equilibrium is to return the patient to his home, no matter how humble or how unsanitary it may be. If this is impracticable, transfer him to another house, or, at least, to another room, and give him the company of some members of the household from which he came.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

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(Quarter Ending September 30, 1903.)

Chronic Infectious Sympathetic Ophthalmitis.

ABADIE. (*Archives d'Ophthalmologie*, May, 1903.)

Abadie reports two cases of chronic sympathetic ophthalmitis following infection through small areas of denudation of corneal epithelium.

The first case was that of a sixty-seven year old female. The upper portion of the cornea of her left eye was the seat of a grayish infiltration which was apparently of gouty origin. Double cataract extraction was done and the results were perfect for a period of seven months, when the vision of the left eye began slowly to fail. The vitreous humor of the right eye was slightly hazy, and that of the left was much more so. At the inner end of the cicatrix of the corneal incision of the left eye there was a rough furrow which was devoid of epithelium. This area was cauterized and subconjunctival injections of cyanide of mercury were given. After a slight improvement vision failed more rapidly and the ulcer, which had closed, reappeared. A conjunctival flap was formed, and was fastened over the ulcer by sutures. Improvement immediately followed with restoration of vision to that which had been obtained after the extraction.

The second case was that of a forty-eight year old man

in whom the vision of the right eye had been lost as the result of a trauma ten years previously. One year later the vision of the left eye began to fail, and the loss continued in spite of all forms of treatment. The stump of the right eye was of moderate size, the tension was normal, and there were not any tenderness or injection. In the center of the cornea there was a small depression which lacked epithelium. Chronic infection through this area was suspected and the eye was enucleated. Improvement of vision immediately followed and the patient returned to work two months later.

Surgical Treatment of Affections of the Lacrimal Passages.

DE LAPERSONNE¹ AND ROCHON-DUVIGNEAUD. (*Archives d'Ophthalmologie*, May, 1903.) In this most interesting paper the authors arrive at the following conclusions:

A. *Chronic Forms.*

I. Simple lacrimation without discharge. Before attempting any surgical treatment, look for the cause of the lacrimation; lesions of the conjunctiva; of the lids; errors of refraction; diseases of the nervous system. Examine the nose and treat any local disturbances, especially hypertrophy of the inferior turbinates. Then only should the lacrimal passages be touched. After a slight incision of the inferior punctum catheterize with a number two or number three Bowman sound, followed by antiseptic or modifying injections. Catheterization should not be made so as to dilate the nasal canal, the same size sounds being used and care being employed to avoid hemorrhage. In moderate types of cases, electrolysis is of value when prudently used. In such cases it is necessary to remember that it is not only a question of milliamperes, and that the resistance of the mucous membrane is only variable.

II. Lacrimation with discharge, mucoid, mucopurulent, purulent, chronic blepharitis, but without appreciable ectasia of the sac.

The indicated operation in such cases is the completed form of Stilling's operation, especially if it is necessary to preface the ground for another procedure, as for example—cataract.

By means of a Weber knife, incise the lower punctum. Introduce the knife to the nasal side, and upon withdraw-

ing it, turn the edge outward, and while depressing the handle of the instrument, cut the inferior ligament. Pass sound number six. Do not employ any form of injection for eight days' time. Always precede the procedure by catheterization. This operation, excellent for disinfection of the lacrimal passages they say, may be followed by a contraction necessitating the use of larger sounds. In such cases electrolysis is also of value.

III. Ectasia of the sac which the patient empties several times daily by the conjunctiva or through the nose. In these types there have been acute attacks, but there remain only a few adhesions with the skin, or there may be even a fistula without fungosities. With yet more reason, if a mucocele or a large cystic or precystic pouch exists, it is necessary to make a systematic excision of the sac. To do this, a sufficiently long incision made concave externally with dissection of the flap must be effected. After the hemorrhage has been arrested a progressive dissection of the sac, beginning at the inner part, is to be made. This is to be followed by suture, with an inferior drain for two or three days' time. Methodical compression from above downward is then to be made. If, in the course of this operation, unsuspected adhesions are formed, it is better to curette or to destroy with thermo-cautery, rather than to leave a part of the wall of the sac.

IV. Lacrimal fistula with fungosities, particularly if a tubercular lesion is probable or is positive. Extensive adhesion, osseous or periosteal lesions. In such cases it is necessary to destroy the sac. To do this the sac is widely opened by a rectangular incision directed downward and outward. The walls of the sac are dissected as much as possible and the fungosities are curetted away, while the sac is destroyed with the thermo-cautery, especial care being employed while operating at the vault of the sac and at the inferior opening. No sutures should be employed. Iodoform gauze packing should be used. The parts are to be dressed with hydrogen peroxide, and the gauze renewed. Cicatrization should progress from below upward and vicious scar formation need not be feared.

B. Acute attacks.

Phlegmon of the sac, lacrimal tumor, pericystic phlegmon, etc.:

As soon as the suppuration is recognized, make an extensive incision directing the cut upward and inward. While raising the handle of the instrument cut well the tendon of the orbicularis. One must not be content with seeing pus but must be sure that the sac is opened. In acute dacryocystitis due to streptococcus infection in which the lesions are recent, and in which there are no fungosities or ectasiæ, cure may result in a short time without lacrimation, in spite of the intensity of any reaction.

C. Consecutive treatment of the lacrimation in which the lacrimation is due to a hypersecretion-reflex of the gland produced by an irritation or a persistent inflammation of the lacrimal passages from definite obliteration. In such cases all our methods should be directed toward perfection in the treatment of the lacrimal passages. Then only should ablation of the lacrimal gland be authorized.

Two Cases of Isolated Paralysis of the Sixth Pair Consecutive to Cranial Traumatism in Children.

LA ROUX. (*Archives d'Ophthalmologie*, May, 1903.) La Roux reports two cases as follows: A six year old child was injured by having his head compressed between two boats. The patient remained unconscious for fifteen minutes' time. There was a flow of blood from the nose, the mouth, and the right ear. The father noticed that the eyes were crossed.

Except for a retained paralysis of the external rectus muscles recovery was complete in a few days' time. Three months later the paralysis had disappeared on the left side, but it remained unchanged on the right. The paralysis of the left externus was presumed to be due to pressure by a hemorrhagic effusion from the inferior petrosal sinus with which the nerve is in intimate relation. On the right side the paralysis was ascribed to an injury of the nerve by an osseous fragment of the petrous bone.

The second case was in an eight-year-old boy whose head was injured by being compressed between an empty barrel and a pavement. There was a contused wound of the scalp in the left parietal region with profuse hemorrhage on the left side. The day following the accident the parents noticed an inward deviation of the left eye.

For three days after the accident the child suffered from vomiting of cerebral type without any other signs of intracranial disturbance. Two months after the accident recovery was complete. The removal of the symptoms in this case pointed toward compression of the nerve by a hemorrhagic effusion and not by an osseous splinter. The cure does not, however, exclude fracture, since also in this instance compression may have arisen through hemorrhage. The hemorrhage was in favor of a basal fracture—but this symptom, he says, may arise from a rupture of the drum-head, which Duplay states may appear in cranial traumatism without fracture of the base of the skull. He believes that the preservation of the hearing is not of diagnostic value, since this function may be unaffected in longitudinal fracture of the petrous portion of the sphenoid bone and in simple ruptures of the drum-head.

The prognosis of paralysis of the sixth pair by cranial traumatism should, he says, always be guarded, and especially so when there are other symptoms of fracture.

Degrees and Limits of Blindness.

TRUC, Montpellier. (*Annales d'Oculistique*, May, 1903.) Truc draws the following conclusions: Blindness is a morbid state, congenital or acquired, represented by an incurable insufficiency of vision. Socially, it is the visual incapacity to care for one's self. Blindness is absolute, complete, and relative. It comprises the three corresponding degrees. I, absolute blindness without any light perception; V. $O^2 = O.$; II, complete blindness with simple light perception. V. $O^2 = O.$; III, relative blindness with lowering of form perception V. $O^2 = O. 1.$

The visual acuity of $O. 1$ with the ordinary conditions of visual field, validity and intelligence, should be considered the extreme limit of "blindness." Socially, above this degree vision is to be understood as existing. He says that the various establishments for the blind, the army, the courts, the insurance companies, and the statistician—all may accept practically this extreme limit, and these various degrees of blindness.

On Primary Zonular Opacity of the Cornea.

KALT. (*Annales d'Oculistique*, May, 1903.) Kalt re-

ports the following case of this affection: A seventy-three year old man had had a right sided traumatic cataract which had become absorbed. No ophthalmoscopic changes in either side could be seen. On the right, there was a superficial greyish brown corneal opacity the shape of a comma, the tip pointing down and out to about two millimeters beyond the center of the cornea, and the head reaching to one and a half millimeters from the limbus. On the left side the opacity consisted in a horizontal band which was four millimeters broad, the two extremities reaching to within one to one and a half millimeters of the limbus of the membrane. In the center of the band there was a vertical transparent fissure which was one-fourth of a millimeter wide.

The patient had suffered for years from rheumatic pains in the muscles and joints, and from nephritic colic. Five years previously, he had had a severe attack of asthma. The urinary examination showed a markedly increased amount of phosphates. The author decided upon the removal of the superficial corneal layers of the left eye which he performed with a von Graefe knife. The parenchyma immediately became transparent and the time of recovery occupied only a few days.

The histological examination of the excised part showed the opacity to be due to an infiltration situated between the epithelium and the membrane of Bowman. It consisted of the remains of a concentrated solution of phosphate of lime, this salt having been held in this state probably by the presence of carbonic acid. As a result of the loss of this gas precipitation occurs and the deposit may remain indefinitely without producing any reaction on the part of the tissues. In the case noted by Bowman, however, the membrane of Bowman was covered with cauliflower-like vegetation. Of the twenty-seven cases collected by Manzutto only one recovered spontaneously. The case, reported by Schiess, was that of a young man of twenty-eight years in whom after some form of affection there developed imperfect vision of both eyes, the right being the first which was affected: but partially recovering with a better vision than with the left. On the right side the opacity invaded the lower inner and upper inner segments of the cornea and partly covered the pupil-

lary area. From the limbus it was separated by a narrow band of transparent tissue, while in the center there were two transparent islands. On the left side there was a wide transparent band which completely covered the pupillary area. The opacity was formed by an infinitude of small dots which were closely placed and which were confluent in many places. Intraocular tension was plus on each side, but there were not any other symptoms of glaucoma. Instillations of pilocarpine were given. The patient ate largely of raisins and drank much sweet pear cider.

Three months later the general health of the patient was much better and the corneae were almost clear. Schiess, he says, attempts to explain the cure as the result of an antiglaucomatic treatment. The author believes that the organic acids of the fruit may have caused solution and absorption of the deposits. These deposits in the cornea he says, are favored by age, by a gouty diathesis, by diabetes, etc. The hard form of the opacity he believes is due to corneal massage exerted by the lids, thus forcing the evenly deposited precipitate into a central transverse position. The medical treatment, he says, may consist in fruits, antigouty remedies, etc. Surgical aid should include only removal of the corneal epithelium. Subconjunctival injections of normal salt he adds might so influence the nutritive currents of the parts as to produce an absorption of the other salts.

Ophthalmic Surgery of the Frontal Sinus.

VALUDE. (*Annales d'Oculistique*, May, 1903.) Valude takes exception to the statement of Lermoyes that the Kuhnt-Luc operation is the method of choice in all cases of simple frontal sinusitis. He reports three instances: two of mucocoele and one of true sinusitis in which the plan of simply opening the sinus with evacuation of the contents and lavage with slight curettement in the third case, were followed by cure. His conclusions in regard to such cases are as follows:

The frontal sinusites which come under the observation of the ophthalmologist are often of an encysted nature without neighboring complications or infectious tendencies; quite frequently they belong to the mucocoeles.

The justifiable operative treatment of these types of sinusitis is simple, on account of their feeble tendency toward nasal or encephalic complications.

Simple opening at the level of a spontaneous orbital orifice with or without curettement of the orifice or interior of the sinus, is, he believes, the operation of choice. Concomitant frontonasal drainage is to be rejected as a useless and troublesome complication.

One should, he says, attempt rather to obtain a rapid cure and union by primary intention of the cutaneous incision after opening the sinus with evacuation of its contents. In case of failure there still remains the radical method such as the Kuhnt-Luc or that of Luc alone.

There is no inconvenience, he believes, but only an advantage in attempting at first to make a simple incision and curettement in the treatment of frontal sinusitis with orbital extension.

On the Etiology of Ophthalmia Neonatorum and the Obligatory Declaration Imposed.

MORAX. (*Annales d'Oculistique*, May, 1903.) A law of public hygiene, passed Feb. 15, 1902, requires, Morax says, the obligatory declaration of ophthalmia neonatorum by physicians, health officers, and midwives.

To aid in the application of this law he describes the etiology of the affection, drawing the following conclusions:

Under the name of ophthalmia neonatorum there are grouped a series of conjunctival infections of which the etiology is very definitely known and determined for the one; while for the other it is still a subject for discussion. The infection by the gonococcus is the cause of one-half the cases of ophthalmia developing within eight days after birth of the affected individual.

Among the ophthalmias which develop within eight days after birth or after this time, a very small number is due to an infection by the Weeks' bacillus, the pneumococcus, or the streptococcus. In the greater number of cases, the examination of the conjunctival secretion does not reveal any microbe to which the infection may be ascribed. In a small number of instances the conjunctival inflammation like a coexistent coryza appears to arise from a he-

reditary syphilitic infection. For the remainder, all conclusions as to etiology appear to the author as premature. Nothing, he says, authorizes the belief that non-blenorrhagic ophthalmia is the result of uncleanness on the part of the midwife or nurse.

Spinal Lymphocytosis and Ocular Affections.

DE LAPERSONNE. (*Archives d'Ophthalmologie*, June 19, 1903.) De Lapersonne has studied the cerebrospinal fluid in sixteen cases of ocular affection. In one instance he made two punctures. Of the seventeen observations, eight were positive and nine were negative.

The positive cases consisted in three of specific neurochorioretinitis, three specific iritis cases; two meningitis cases with neuritis, and one case of paralysis of the third pair in a patient of fifteen years of age. In this last instance, the positive reaction inclined the author toward a diagnosis of acquired syphilis. A negative reaction was found in three cases of specific neurochorioretinitis, all being in the progressive stage, one of them having formerly given a positive reaction; one case of iritis; three of postneuritic atrophy of indeterminate origin; one of cerebral tumor, and one of ophthalmic migraine. In obtaining the spinal fluid the usual technique of a Quinke puncture was employed. The author believes a lumbar puncture with a positive lymphocytosis is of diagnostic value in a certain number of recent lesion cases of either the anterior or the posterior ocular segments, and especially so in those cases in which there are doubtful syphilitic antecedents. Depending on the more or less rapid disappearance of the lymphocytosis, the method, he says, is of prognostic value.

Partial Ablation of the Ocular Globe by the Process of Subenucleation.

NICATI. (*Archives d'Ophthalmologie*, June, 1903.) Nicati performs this operation as follows: A horizontal or vertical incision is made into the conjunctiva on the inner side of the globe. The adductor muscle is seized, divided through its tendon and guarded by a catgut suture which is passed through the tendon and the conjunctiva. The capsule is separated above and below and the optic nerve

is sectioned in the ordinary manner. The posterior pole of eyeball is seized with a tenaculum and is drawn forward. It is separated from the oblique muscles and is drawn through the conjunctival opening, after which the posterior portion of the globe is exsected up to the insertion of the rectus muscles. The conjunctival opening is closed, and the tendon of the internal rectus muscle is secured. An accumulation of blood back of the cornea forces the eyeball forward but this, he says, is removed by compression.

Convalescence is more rapid than in total enucleation, and the results are an excellent stump with the conjunctiva entire.

Sympathetic ophthalmitis is avoided, the anatomopathologic collections alone being the losers.

Two Cases of Tumors and Pseudotumors of the Lacrimal Gland.

COPPEZ. (*Archives d'Ophthalmologie*, June, 1903.) Coppez reports three cases of sarcoma of the lacrimal gland. The first was in a sixty-one year old male who five years previously received a slight injury to the right upper lid. Six months later he noticed a pea-sized hard tumor situated at the level of the lacrimal gland. The growth continued to enlarge and began to interfere with the ocular movements, and finally producing a hypopyon keratitis by failure of closure of the lids. Examination revealed a pigeon-egg sized and rather soft smooth mass occupying the region of the lacrimal gland. This mass was removed by the Krönlein operation. Convalescence was rapid, and there has not been any return in the two years that have since elapsed. Examination of the growth showed it to be encapsulated and that it was free of the lacrimal gland. The microscopic structure of the mass was that of a small round celled myxosarcoma.

The second case was that of a small round celled sarcoma of the lacrimal gland. There has not been any return after three years' time. The patient was a female of forty-one years of age. In the region of her right lacrimal gland there was a hard, smooth tumor which was apparently the size of a pigeon's egg. It dipped deeply

into the orbit. The growth was removed through an incision made along the orbital margin.

The third case was a sarcoma of the lacrimal and parotid glands of the same side. Ablation of the two masses was effected, followed by a return on the corresponding cervical ganglion eighteen months later. The patient was a sixty-one-year-old female who for a year previously had noted that her right eye seemed to be becoming smaller. There was swelling in the right parotid region which dated back for one month's time. Examination showed a firm growth in the region of the lacrimal gland. Immediately beneath the right ear there was a small soft swelling which was pendant from the parotid gland. The lacrimal tumor was removed by Krönlein's operation and the parotid growth extirpated through an incision made along the anterior border of the gland.

The fourth case was that of pseudotumor of the lacrimal gland (sclerosis consecutive to dacrioadenitis). Extirpation was followed by cure. The patient was a male, aged sixty-five years. One month before being seen he had a painful swelling situated in right lacrimal region. Examination showed a hard baselated and mobile tumor in the region. The growth was removed through an incision made under the brow.

The fifth case was that of traumatic luxation of the lacrimal gland into the orbit simulating an orbital growth. The patient was a female of twenty-four years of age. A few months before she was seen for the first time she had injured her left brow by a fall. After this she noticed that her left eye remained drier than its fellow, especially when she was crying. Examination revealed the presence of a hard, smooth, hazel-nut sized tumor about the middle of the orbital vault. The mass was removed, and was found to be simply an almost normal lacrimal gland.

Histologic Researches Into the Nature of Xanthelasma of the Eyelids.

VILLARD, Montpellier. (*Archives d'Ophthalmologie*, June, 1903.) Villard's conclusions, in part, are as follows: The characteristic element of xanthelasma is a special cell, "the xanthelasmic cell," which is found in the derm, either isolated, or much more frequently grouped in quite large

granules, when well developed, this cell is of voluminous size, rounded, mononuclear or more rarely polynuclear, and apparently without any cell wall. Its protoplasm consists of a series of reticulated thin lamina, between which lie spherical spaces filled by a clear spherical body which does not react to stains, and a peripheral nucleus. In proportion as the xanthelasmic nodules develop, the surrounding connective tissue frame work diminishes. The cells grow and fuse, giving rise to the polynuclear elements which are so often found. This fusing of the cells continues, leaving only a coagulated homogenous mass. The substance resembles in its refrangibility, coagulability, and in most of its characteristics, the clear material that forms the globes filling the xanthelasmic cells, but differs from it in that it takes up stains more readily.

Streptococcic Infections of the Conjunctiva.

POULARD. (*Archives d'Ophthalmologie*, June, 1903.) Poulard reports four cases of conjunctival infection, which he has grouped under the name of streptococcic infection because of the abundance of the streptococcus germs in the conjunctival secretions.

In two of the cases there was a delicate false membrane which was limited to a small area, that failed to reappear after ablation. In the two grave cases there was an impetiginous eruption. In one of the other cases there was an erythematous eruption of the skin of the eyelids, the relation of which to the conjunctivitis is difficult, he says to establish. In all the instances noted there was considerable swelling of the lids, which however did not attain that which ordinarily accompanies gonorrheal conjunctivitis. Twice there was perforation of the cornea, and once there was a small benign ulceration. In all of the cases, there was a marked preauricular adenitis—a symptom, he believes, of some diagnostic value.

The conjunctivitis, if the modifications due to the complications are not considered, begins to improve from the fifth day to the tenth day and continues slowly to a cure, in one case the interval between the infection of the eyes was but one day. In another only one eye was infected. In many instances it is certain that the streptococcic infection develops upon preexisting affections; it being

doubtful in any case whether it could develop on a normal conjunctiva. The author concludes with the following etiological grouping. I, streptococcic conjunctival infection of lacrimal origin; II, infection developed in the course of or after an infectious malady (measles, scarlet fever, diphtheria); III, infection grafted upon an other form of conjunctivitis. (diphtheritic, impetiginous, or that which is due to the diplobacillus.)

Detachment of the Retina and Paludism.

TERSON, Toulouse. (*La Clinique Ophthalmologique*, May 25, 1903.) Various ocular disturbances have been reported as due to paludism, but among these, Terson says, retinal detachment has not been noted. He has observed two cases in which shortly after a severe attack of the tertian form of fever the vision of one eye became markedly reduced by a quite extensive retinal detachment. The nature of the relation between the malarial intoxication and the detachment the author does not attempt to assert.

Benzoate of Lithium in the Treatment of Corneal Maculae.

MAZET, Marseilles. (*La Clinique Ophthalmologique*, May 25, 1903.) Calcium carbonate and phosphate, Mazet tells us, have been found to exist in a great number of corneal lesions. It is therefore reasonable, he says, to believe that in dissolving these salts, vision may be improved. Bunbacher alone, he tells us, has attempted to do this by means of a 5 per cent. solution of sodium carbonate. This method is too violent for habitual use. In order to obtain the same result the author has used an aqueous solution of lithium benzoate in two and a half to ten per cent. strengths. The action of lithium benzoate as a solvent of the carbonate and phosphate of calcium is, he says, well established. For four years past he has employed this method and reports two cases. In the first, in a child of eight years, there was a diffuse corneal haze dotted with white points, which prevented a view of the pupillary area. Yellow oxide of mercury ointment had been used without effect for a period of six months. Instillations of lithium benzoate solution resulted in a cure one year later. In the second case there was a densely

opaque semilunar scar involving the lower part of the cornea. It had the appearance of being incrustated with calcareous material. Former treatment having been useless, instillations of the lithium benzoate solution were used for six months, resulting in a cure of the case.

The Grave Forms of Epithelioma of the Conjunctiva.

FAGE, Amiens. (*La Clinique Ophthalmologique*, June 10, 1903.) Epithelioma of the conjunctiva, Fage says, has been considered a relatively benign tumor by the majority of ophthalmologists. There exists, however, a malignant form of the disease which spreads inward through the limbus or extends externally, involving the bulbar conjunctiva, the lids, the orbit, the preauricular glands, etc.

He reports an instance of the latter type in a forty-nine year old male who noticed a papillomatous plaque situated at the lower outer limbus of the left cornea. Five months later the patient came to the author with an ulcerating flat growth attached to the sclerotic, situated between the external canthus and the limbus. Antisyphilitic treatment with serum therapy was negative. Three months later the eye was removed because of an extension of the mass and corneal ulceration. Two months after this there was a return of the neoplasm with invasion of the preauricular and parotid glands. Histologic examination of the growth showed it to be formed of epithelial masses whose prolongations passed into the connective tissue stroma. Many of the cells showed nuclei in a state of division or coccidial figures. The number of the cells expressing karyokinesis he believes is in direct proportion to the gravity of the prognosis. Pigment deposits in the cells have been also observed in epithelioma, these not being reserved to sarcoma as, he says was formerly believed.

Contribution to the Use of Bichloride of Mercury in Ocular Practice.

PIROUX, Reims. (*La Clinique Ophthalmologique*, June 10, 1903.) Piroux reports a case of uncomplicated cataract extraction in which irrigation of the eye before, during, and after the operation, was done supposedly with a solution of cyanide of mercury. The first dressing five days later,

showed a whitish infiltration of the upper half of the cornea, an unformed anterior chamber, and a redness of the lids, forehead and cheek.

The ocular condition remained unchanged for almost three weeks' time, when the author discovered he was using a bichloride of mercury irrigating fluid instead of the cyanide. With the renewal of the proper solution, the anterior chamber soon closed, but the corneal haze persisted, rendering an inferior iridectomy for optical purposes necessary. The evil effects of bichloride of mercury in ocular irrigations, is, he says, well known. Nüel and Cornil have demonstrated that these corneal changes involve the endothelium and that there is also a marked edema of the parenchyma which upon subsiding, leaves undulating corneal cells, which by their deformity, produce a partial opacity. In addition, the cyanide of mercury does not affect metallic instruments, does not coagulate albumen, is three times less irritating than bichloride of mercury, and is of equal bactericidal strength—being employed by the author in a 1 to 1000 per cent. strength solution.

On the Treatment of Purulent Ophthalmia by Concentrated Solutions of Potassium Permanganate.

VIAU, Toulon. (*La Clinique Ophthalmologique*, June 10, 1903.) Viau employs a one to ten per cent. strength solution of potassium permanganate in purulent conjunctivitis, applying it to the lids by means of a cotton applicator. When the lids cannot be raised, the applicator is forced between the eyelids and the globe, into the cul-de-sac. His percentage of cures in fifty-three grave cases was one hundred.

The following advantages are claimed by him: I. Rapidity of cure; II. Innocuousness of concentrated solutions on the cornea; III. Applications are less painful than those of silver nitrate; IV. The drug does not aggravate the diphtheritic form of conjunctivitis when the diagnosis is uncertain in the beginning, while silver produces considerable disturbance.

Introduction to the Study of the Use of the X-ray in Ocular Therapeutics.

DARIER. (*La Clinique Ophthalmologique*, 10th. July,

1903.) Darier reviews briefly the now well known technique and results of x-ray therapy as applied in general medicine. In ocular therapeutics, he says, it is less well known. Stephenson reports a case of cure of conjunctival tuberculosis in an infant of four years after thirteen sittings of ten minutes each, the tube having been placed at a distance of six inches. The author states that the method is painless and is not fraught with any danger; Mayou however having noted loss of the cilia with conjunctival irritation. In the treatment of trachoma the employment of the x-ray has been found of much value.

Therapeutic Indication for Intravenous Injections of Cyanide of Mercury.

ABADIE. (*La Clinique Ophtalmologique*, 10th. July, 1903.) Abadie informs us that no one method of administering mercury is efficient in all cases of syphilis. He believes however that in certain cases, intravenous injections of a soluble mercurial salt are of more value than those which are made into the subcutaneous cellular tissue where their introduction provokes reaction and probable change in the chemical constitution. He has employed intravenous injections in the treatment of ocular syphilis for ten years past, and in a general way has found that the method is incontestably superior in the tardy and not grossly inflammatory manifestations of the general disease. They are also of use in late and chronic cerebrospinal syphilis and in syphilis among the senile. In a case of a fifty-four year old man suffering from chorio-retinitis which had developed twenty-six years after the initial lesion and had reduced the vision of the right eye to two-thirds of normal and that of the left eye to one one-hundredth, treatment by inunctions had failed; but under the employment of the intravenous method of one-tenth strength doses of the cyanide of mercury, the vision of the right eye returned to normal and that of the left eye to one-twentieth of normal.

The second case was that of a thirty-six year old man, who eight years previously had had an attack of specific iridochorioiditis which had yielded to the use of subcutaneous injections of mercuric cyanide. The present condition began as a chronic specific myelitis which refused

to yield to inunctions or to the subcutaneous use of the cyanide of mercury. Intravenous injections were then given, giving rise to rapid improvement. This treatment was continued for a period of six years, a relapse following a suspension of the drug for three months.

The third case was in a fifty-nine year old man who had a chorioretinitis in each eye reducing the vision of the right eye to one-tenth of normal and vision of the left eye to one-half of normal. After the failure of other forms of mercurial treatment the use of intravenous injections improved the vision of the right eye to one-half and that of the left eye to two-thirds.

Cuprocitral and Its Use in Trachomatous Conjunctivitis, Results Obtained.

VON ARLT, Gratz. (*La Clinique Ophthalmologique*, 10th. July, 1903.) Cuprocitral is a five to ten per cent., strength mixture of citrate of copper in glycerine ointment (of the Austrian Pharmacopœa) is, von Arlt tells us, a pomade which is turquoise blue in color and remains stable for one year's time when kept in glass boxes. The ointment is introduced into the conjunctival cul de sac on a small flattened tipped glass rod, light massage being practiced for one-half a minute through the closed lids. When the patient employs the ointment himself, the material is placed only into the lower cul de sac. The five per cent. strength ointment is first used, being applied three times a day. Cuprocitral is used in the same class of cases as those in which sulphate of copper is employed and is not suitable to those cases in which there is a mixed form of disease—especially those which are accompanied by lymphatic conjunctivitis; those which are associated with marked secretion, and in advanced corneal lesions or ciliary irritation. The drug is not painful, it being neither an irritant nor a caustic. It can be applied with safety by the patient. The author has collected three hundred and six cases: of these two hundred and sixty-three were much improved. The preparation was well tolerated in every instance.

The Use of the X-ray in Ocular Therapeutics.

BETHEMILOUX, Roubaix. (*La Clinique Ophthalmologique*,

10th. July, 1903.) The use of the x-ray in the treatment of trachoma, was Bethemioux tells us, inaugurated by Rust and by Mayon, and Stephenson and Walsh, the last mentioned authorities making exposures of from ten to fifteen minutes. Mayon, he says, employs exposures not exceeding two minutes, thus avoiding the slight irritation and occasional loss of cilia which are sometimes produced by longer exposures. The author makes short exposures daily or at least four or five times a week, the tube being placed at from four to ten inches from the eye. He uses a three to four ampere current of sixteen volts' strength. Stephenson and Walsh have found, he says, that eversion of the lids is unnecessary. The author states that two of his three cases experienced more relief after eversion.

In the three cases treated by him the results seemed superior to those which are obtained after the usual treatment. Especially was this so in a case in which pannus predominated. In one case of phlyctenular conjunctivitis with corneal ulceration marked improvement accompanied a six weeks' use of the x-ray for one minute four or five times a week.

The author believes the use of the x-ray in ocular therapy to be innocuous when properly applied.

A Case of Tumor of the Orbit with Unilateral Exophthalmos and False Symptoms of Basedow.

TRUC, Montpellier. (*La Clinique Ophtalmologique*, July 25, 1903.) Truc reports the case of a female aged fifty-two years who first noticed a persistent pain in the left eye, in which, a month later, a moderate visual loss with slight exophthalmos developed.

Examination failed to show any diplopia. There was a slight exophthalmos with a marked chemosis below in association with some edema in the inferior orbital region. Vision was reduced to six-twentieths. The pupil was slightly dilated. The iris was sluggish, and there was some congestion of the retinal vessels. Examination of the orbit did not show the appearance of a growth. There was slight palpitation of the heart, tachycardia of one hundred to one hundred and twenty, and a marked tremor of the hand which was exaggerated by the least motion or excitement. A diagnosis between orbital tumor and Bas-

dow's Disease could not be determined until the development of a palpable orbital tumor a few months later. The orbit was then exenterated, it being found filled with a soft tumor of the size of a hen's egg that had invaded the upper and inner orbital walls without marked compression of the optic nerve. The patient died a month later from a return of the growth which proved to be either an epithelioma or an endothelioma.

Note on a Case of Bilateral Blindness Consecutive to Measles.

MARCEL, ROLLET, Blais. (*La Clinique Ophtalmologique*, July 25, 1903.) The amaurosis or amblyopia following measles, these authors state, may be either transitory and with or without fundus changes or may develop into a permanent condition. This has been ascribed to meningitis, uremia, retrobulbar neuritis, or to changes in the cerebral cortex. They report the case of a thirteen year old child in whom during an ordinary convalescence from measles a permanent blindness developed while the patient was asleep. When seen four months later by the author, the pupils were freely and equally dilated. The irides were immobile. The media were clear. The fundus was of a uniform orange yellow color passing into a gray tint in the peripapillary and the macular regions. The retinal vessels were much reduced in size. Visual acuity was four-fiftieths in each eye. The form fields were reduced to ten degrees and fifteen degrees in the right and left eyes respectively. At a later period the fundus changes resembled those which are found in pigmentary retinitis except that here the pigment deposits were somewhat larger. The condition is ascribed by the authors to an acute degeneration of the retina and optic nerve induced by toxemia of measles.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

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(Quarter ending September 30, 1903.)

The Frequency and Significance of Anisocoria, Etc.

SCHAUMANN, O. (*Zeitschrift für klinische Medizin*, 1903, 49 Band. I—4.) The author found in an examination of 1168 patients 27.9 per cent., and in an examination of another series of 723 patients 37.8 per cent., who had inequality in the size of the pupil. This inequality is about equally divided between male and female. The left pupil was oftener dilated than the right. Simple inequality in the size of the pupil was more often found in neuroses than with diseases which were not associated with disturbances in the nervous system. In the cases where the difference of the size of the pupil could not be traced to an organic disease of the nervous system it was regarded as an evidence of some constitutional anomaly. One must distinguish then between symptomatic and constitutional anisocoria. Among the functional forms is the alternating form, the so-called "springing mydriasis." The author describes eleven cases of this variety and in most of them he was able to demonstrate the presence of a neuropathic basis and he is disposed to regard it as a symptom of hysteria. It can not be regarded in itself as a serious symptoms. The diagnostic value then of the symptom anisocoria is very limited. It generally in-

icates constitutional weakness of some kind and is to be ranked among the symptoms of degeneration.

The Causes of Blindness in Egypt.

OSBORNE, ALFRED. (*Archiv. für Augenheilkunde*, Bd. 47.) Osborne gives a statistical review of the causes of blindness which he has collected from an examination of five hundred individuals. The ability to see no more than the movements of the hand he regards as blindness. It was shown that eighty per cent. of all were to be attributed to acute purulent conjunctivitis, trachoma and glaucoma. Trachoma contributed 11.8 per cent. Primary glaucoma 29.8 and 38 per cent. were found to be due to blenorrhea neonatorum. The remaining twenty per cent. are to be traced to traumata and to sympathetic ophthalmia.

Suprarenin Muriate.

SCHNAUDIGEL, OTTO. (*Die Ophtalmologische Klinik*, July 5, 1903.) The author states that this product is much more stable than adrenalin and much cheaper. He uses it pure and in combination with alkaloids such as eserine, atropine, cocaine, and with astringents such as sulphate of zinc. He has been particularly struck with the value of suprarenin in diseases of the tear passages in phlyctenular conjunctivitis and in spring catarrh and he uses the agent invariably in all operations. He goes on then to mention a few of the objections which have been urged against the suprarenal extracts, objections which of course hold good for suprarenin.

An Experiment with a Twenty-five Per Cent. Subconjunctival Injection of Iodipin.

NEUSTAETTER, OTTO. (*Die Ophtalmologische Klinik*, June 20, 1903.) The patient was thirty-four years old and complained of very cloudy vision. There was a myopia of seven dioptries and a vision of less than 6/50. The other eye was also highly myopic and having undergone degenerative changes no longer participated in the visual act but turned sharply inward and had only light perception. One half of a syringe of a 25 per cent. iodipin solution was injected into the left eye. Considerable pres-

sure was necessary to force the fluid in and quite a little blister remained at the point of the injection and a good deal of pain followed, which lasted for some time. On the third day the same quantity of iodipin was injected and three days later another dose of the same size was employed. After the second injection the patient reported that the opacities were much smaller and the vision had risen to 6/50 while with the ophthalmoscope marked improvement was noted. Being encouraged by the result in this eye he was lead to try the same treatment on the other eye though with little hope of accomplishing anything. It will be remembered that the patient could only see light with this eye. After the second injection he could make out the outlines of the window panes and a third injection enabled him to see the figures on the curtain and the eye no longer squinted but participated in the visual act. Sometime after the fourth injection with the aid of a strong compound lens he saw large letters at six metres but could not make them out. One great objection to the substance is the slowness with which it is absorbed. In fact it was evident at the point of injection more than a month after the injection. An incision was made in the lump and the contents emptied. He suggests that the injection be made in either the upper or lower transition folds so that the resulting lump will not interfere with the movements of the eyeball.

Scopolamine.

SALOMONSOHN. (*Die Ophthalmologische Klinik*, May 20, 1903.) Salomonsohn calls attention to the unirritating properties of scopolamine also to the absence of toxic symptoms. Usually we employ this drug in solutions of two grains to the ounce but recently the author employed it in an intense iritis in the strength of fifteen grains to the ounce and not only did it produce no ill effect but had the most happy effect. Since then he has frequently used it in keratitis and iritis, in one case which had shown great intolerance of atropine there were also some toxic symptoms observed after using scopolamine.

Diseases of the Eye in the So-Called Hay Fever.

KOSTER-GZN, PROF. W. (*Zeitschrift für Augenheilkunde*,

1903, Heft I.) The author has been himself a sufferer with hay fever and he has found in the commencement of the trouble that painting the nasal mucus membrane with a one per cent. nitrate of silver solution was a positive help, when associated with the instillation into the conjunctival sac of a 0.2 per cent. solution of nitrate of silver twice daily. Zinc sulphate and the other astringents seem to have no effect. He found inhalations of menthol very beneficial. He does not agree with Franke in thinking that the eye symptoms are reflex in character but regards the conjunctivitis as a part of the disease.

Brucine in Ophthalmology.

SKORJUCHOW. (*Die Ophthalmologische Klinik*, May 20, 1903.) The author has been using a preparation which contains less than 0.1 strychnine. It is injected under the skin of either the temporal region or of the arm in quantity varying from 0,005-0,02. When the injections are made daily he generally uses 0,01 and if the intervals are greater he uses 0,02. The number of injections in cases of optic nerve atrophy were twenty-six and from forty to fifty in cases of retrobulbar neuritis. In employing this treatment one must be careful to keep a close record of the visual field and to stop the treatment if there appears the slightest evidence of retinal irritation. He has employed this treatment in forty-six cases (eighty-nine eyes) and in sixty-seven eyes improvement was noted. In eighteen no result was obtained, while in four eyes the process went on to get worse. All in all he thinks that this drug certainly increases the intensity of the central and peripheral vision of both healthy and diseased eyes and stimulates the action of the muscles, diminishes the grade of the paresis, and frequently produces dilation of the vessels of the fundus. He advises its use then in various forms of amblyopia, in acute and chronic retrobulbar neuritis of either alcoholic or other origin, in ordinary optic nerve atrophy and in retinitis pigmentosa and in the various forms of ocular paralysis. It is to be preferred to strychnia in the treatment of optic nerve atrophy inasmuch as it produces a dilatation of the vessels of the retina and in this way promotes the carrying off of the pathological products at the same time helping the nutrition of

the part. The treatment is contraindicated in all acute inflammations, as for instance in retinitis.

The Eye Disturbances in Egyptian Chlorosis.

NIEDEN. (Extracted from *Centralblatt für Praktische Augenheilk.*, July, 1903.) The author found great paleness of the arteries and veins, the former not looking full. Occasionally pulsation was seen, and also tortuosity of the veins. Hemorrhages were often seen in the eyegrounds resembling those seen in pernicious anemia. These hemorrhages are arranged in streaks and sometimes are seen in specks and isolated foci following the course of the bloodvessels. The changes in the macular region which are peculiar to albuminuric retinitis are seldom seen here. Visual disturbances are usually present, there being narrowing of the field, anesthesia of the retina, accommodative and muscular asthenopia and diplopia, vertigo and tendency to nystagmus.

Myopia and Diabetes.

NEUBURGER, (*Münch. Med. Wochenschrift*, 1903, No. 12.) Neuburger reports two cases of diabetic myopia to which class of cases Hirschberg first called attention in 1890 and which observation is of the highest importance because it was through the changes in the eye, rather the condition of the refraction, that the abnormal condition of the urine was first discovered. Both cases reported by Neuburger had been examined several months previously and been found to have normal refraction and both made their appearance later with a refraction varying from minus 1.50 to minus 2 dioptries. In both cases an examination of the urine showed the presence of sugar. Diabetic myopia is generally attributed to a change in the lens. When we meet with a myopia suddenly appearing we must suspect the existence of diabetes, though beginning cataract may be the cause, still an examination of the urine is called for. He calls attention to the fact that marked weakness of the accommodation is present in diabetes and not spasm of the accommodation.

Conjunctival Injections of Iodipin.

ALEXANDER, L., Nurenburg. (*Die Ophthalmologische*

Klinik., August 20, 1903.) Alexander's observations simply confirm those of Neustaetter. He has also had the experience as regards the length of time it takes for the absorption of the iodipin and in one case four months after the injection a lump the size of a bean was to be seen at the point of the injection. A very decided objection is the fact that a discoloration of the conjunctiva remains and this in his opinion was sufficient reason for abandoning the treatment. He does not think that the treatment has any marked advantages over the internal administration of the iodides.

The Eye Changes in Ankylostomiasis.

NIEDEN. (*Wochenschrift für Therapie und Hygiene des Augus.*, July 30, 1903.) The eye changes according to Nieden consist in marked paleness of the conjunctiva, a peculiar lustre of the sclera, great paleness of the blood in the arteries which are usually much narrowed. The veins are tortuous and sometimes we have arterial pulsation. The papilla is often the color of porcelain, and there are characteristic hemorrhages somewhat resembling those seen in pernicious anemia sometimes appearing in isolated spots and sometimes as radiating streaks which follow the course of the bloodvessels. These hemorrhages are more numerous in the periphery of the retina and show a great tendency to fatty degeneration. The subjective symptoms according to the site of the hemorrhages and the grade of the disease consist in central visual disturbances, narrowing of the field and retinal anesthesia, accommodative and muscular asthenopia with diplopia and a tendency to nystagmus.

Congenital Lack of Tear Secretion.

SOMMER, G. (*Klinische Monats. für Augenheilk.*, May and June, 1903.) The case reported by Sommer is an exceedingly rare one. The patient was a child of two and half years old. The mother reported that even at the time of the accident in which the child was burned the manifestations of pain were not accompanied with tears. The child was bright and well nourished. The conjunctiva and tear passages were normal. The ophthalmoscopic examination was negative. The salivary glands were in proper con-

dition. Local irritation could not induce any flow of tears. The internal administration of jaborandi as well as instillations of pilocarpine and eserine made no particular change in the condition. It seems that this is the only case reported in literature.

Eumydrine.

GOLDBERG, HUGO. (*Heilkunde*, No., 3, 1903.) Goldberg has been making some experiments with this drug which is nearly related to atropine. He found that in solutions of 1:100 it was preferable to the solution of atropine (1:1000), in that it produced a prompter and more effective mydriasis than the latter and that its effects disappeared at the end of the second day while in the case of atropin the effect persisted for several days. As compared with homatropine of the same strength it is preferable as it produces more complete dilatation and does it more quickly. When used in the diseased eye its effects in this strength seem scarcely less than that of the 1 per cent. solution of atropine. So far as the experiments went there was certainly no evidence brought out to show that it increased intraocular tension or in fact that it had any injurious effect whatever.

The Operative Treatment of Gonorrheal Ulcerations of the Cornea.

GOLDZIEHER. (*Bericht der Pester Med. Chirurg. Presse*, No. 30, 1903.) The greatest danger in gonorrheal conjunctivitis is ulceration of the cornea, a complication which is quite liable to occur. The author reports two cases. In the first case the perforation was promptly followed by prolapse of the iris leaving a blister-like prominence. The upper portion of the conjunctiva was dissected away quite up to the fornix, threads passed in and then this flap brought over the ulcerating area (after the prolapsed part had been excised) and secured.

The other case was practically the same except that the perforation was below and the conjunctival flap was brought up from the lower fornix. The result in both cases was admirable, especially in the second case. He advises not to wait for perforation but as soon as it looks as though perforation were imminent the plastic operation should be done.

Conjunctivitis Following Contagion from the Secretion of a Vaginal Catarrh in a Cow.

BAAS, J. HERMANN. (*Zeitschrift für Augenheilkunde*, July, 1903.) The following is the account of a very interesting case as reported by Baas. The patient was a man whose left eye was affected. The borders of the lids were swollen and covered with brownish yellow crusts and there was considerable secretion between the lids. The conjunctiva of the lids was also red and swollen while that of the ball was very chemotic so that it formed a wall-like elevation around the corneal border. At first a specific trouble was suspected but this was shown not to be the case. Atropine was instilled and a five per cent. solution of protargol employed together with ice applications. The next day the trouble was better. It turned out that several days before the appearance of the conjunctivitis he had assisted at the delivery of a calf and being much heated he had probably rubbed some of the secretion on his hand in his eye. It was shown too that the veterinarian whom he had assisted in the operation was a few days later affected with an eruption which broke out all over the arm which had been introduced into the vagina.

A Peculiar Case of Eye Inflammation in Association with Articular Rheumatism.

STERN. (*Wochenschrift für Therapie und Hygiene des Auges*, August 27, 1903.) Stern's case was that of a young man who when first seen had been suffering for several days with an inflammation of the right eye. The lids were somewhat swollen and red while the conjunctiva of lids and ball were very congested. In addition to this there was a marked bluish-red ciliary congestion. There was no involvement of the cornea and no precipitates upon the membrane of Descemet, no synechiae. The picture then was that of a very intense conjunctivitis together with deep ciliary injection. The pain in the eye was intense. It seemed that he had been suffering for several months with severe attacks of articular rheumatism. The condition was first treated as a conjunctivitis but with absolutely no improvement. Atropine was then employed chiefly to get its anodyne effect and partly because of the ciliary injection which betokened possibly uveal involve-

ment. The pupil reacted but the pain and redness persisted. The instillation of adrenalin produced only a temporary effect. He was then put on frequent doses of aspirin and sweat baths were given. In three weeks he was decidedly better. Stern thought the case worthy of record because when we have before us the picture of deep seated eye inflammation without however the well-known symptoms of either iritis or cyclitis we would do well to think of a constitutional cause.

Keratitis Disciformis.

PICK, L. (*Wochenschrift für Therapie und Hygiene des Auges*, August 27, 1903.) The patient whose history is reported had been stung by a fly on the back of the head. Immediately thereafter an intense inflammation showed itself on the right side of the head and face finally taking in the eye. Ten weeks later the patient was first seen by Pick and it then presented the typical picture of keratitis disciformis as described by Fuchs. There was a central gray disc or layer consisting of very fine dots or points which were situated in the middle corneal layers. This area was about 3 mm. in diameter and its border reared up slightly as a grayish ring. A second ring was to be seen within this ring but was not so plainly marked. The vision was 5/35ths. The intensity of the inflammation gradually subsided; after six weeks an iridectomy was performed with result of getting a vision of 5/15ths. During the next four months a gradual clearing up took place although at present there is no appreciable difference in the relation of the border of the involved area to its centre. The case is of interest as the prognosis is usually bad and this is the first recorded case of a cure.

A Contribution to our Knowledge of Symmetrical Orbital Tumors.

BIRCH-HIRSCHFELD. (*Archiv für Ophthalmologie*, LVI Band, 3 Heft.) Birch-Hirschfeld's communication is a very interesting collection and discussion of all the literature of this subject to which he adds a case of his own with a long clinical history and much anatomical detail. Most of the symmetrical orbital tumors which have been reported belong in the group of lipomata and lacrimal

gland tumors. There was a history of injury in his case. He supposes that in both orbits and at symmetrical points there were groups of embryonic cells. Under the influence of the injury there was a further development of the round cells, first of all in the left orbit. Whether at that time there was any tendency to the formation of a tumor in the right orbit or any constitutional cause favoring such a development it was impossible to say. One of the interesting features of the case was the pronounced optic neuritis in the right eye. His explanation (as he acknowledges) is inadequate. His opinion is that tumors of the orbital region or better of the ethmo-orbital region are peculiar in character by reason of their regional origin and that they are all of congenital origin, arising from all kinds of embryonic cells which are in this locality and which are shut up in physiological tissue and bone and which years afterward commence to develop and attain so to speak to the dignity of tumors. As the tissue cells peculiar to the growth are richer or poorer in the elements which go to make up that growth, and according to their mixed character we get either bony tumors or myxosarcomata.

Views as to the Commencement of and Progress of Myopia and the Influence of Full Correction.

SEGGELE. (*Archiv. für Ophthalmologie*, LVI Band, 3 Heft.) The author's views are based upon an analysis of 2070 myopes. Among these 451 had their myopia fully corrected. His conclusions which contain practically everything of value in this communication are as follows: He is a firm believer in hygienic measures for the arrest of myopia, and by this is meant of course eye hygiene. School hygiene is of especial importance in preserving good vision and in setting narrow bounds to the myopia. To a somewhat less degree it controls the progress of myopia or at least it makes the transition to the high grades, the destructive forms less likely, unless it has its origin in a congenital form of the affection. In the sixteenth year too great tax of the eyes should be avoided since at this time of life myopia is apt to be acquired. In the case of girls especially the working hours should be shorter. In individuals with myopia greater than

1.25 D. up to the twentieth, if the accommodation range is good, full correction is always advisable, that is, up to 10 D., with the vision under $\frac{2}{3}$. If the accommodation is in any degree at fault full correction is injurious. In cases of insufficiency of the interni, full corrections should be given and prisms employed.

Cinchonin Intoxication.

SCHOUTE, G. J., Amsterdam. (*Zeitschrift für Augenheilkunde*, Bd. IX., Heft 6.) The following interesting case is recorded by Schoute. The patient was a woman of forty, who for some time had been subject to malaria and was unable to take quinine because of the ill effects of the drug, for after taking the smallest dose she would have attacks of dyspnea and be covered with an exanthem. Consequently she was put on cinchonin sulphate. In twelve hours she was unable to see the minute hands on her watch or to read the register on a clinical thermometer. This happened practically every time she took the drug. One morning she took a powder at six, one at seven and one at eight, and at eleven o'clock her vision began to get cloudy, but at eleven o'clock that night she could see all right again. The trouble then was a paresis of accommodation not associated with any other eye symptoms. The process commenced about four hours after taking the cinchonin and lasted throughout about twelve hours. It seemed to run its course more rapidly when large doses were taken. It is remarkable that none of the symptoms of quinine intoxication were present and so far as we know the symptoms produced in this patient have never been observed as a result of taking the sulphate of quinine. The latter produces subjective symptoms which are clearly referable to an involvement of the retina and not the slightest symptom which could be referred to retinal trouble was noticed in Schoute's case. Quinine, then, is a poison which affects the retina, and cinchonin on the basis of this observation is shown to affect the uvea only. The author thinks however that individuals who have recovered from an attack of quinine amblyopia and in the case of whom it would be dangerous to take quinine might try cinchonin.

The Healing Process in Injuries of the Posterior Capsule.

BOESE, RICHARD. (*Zeitschrift für Augenheilkunde*, Bd. IX, Heft 6.) Boese's experiments were made on rabbits and were suggested by Knapp's experiments which were made to show the healing process in wounds of the anterior capsule. The results of Boese's experiments may be summed up as follows: There is always a possibility of healing of injuries of the posterior capsule in rabbits, this healing process being largely influenced by the character of the wound, whether from in front or from behind. Injuries from the front run their course without any participation of the connective tissue fibres which come from the scar in the eyeball, while in injuries from behind we have just the opposite, namely, a participation of these fibres. This, however, has no special influence upon the healing process. In injuries which reach up to the region of the equator there is a primary closure of the wound through proliferation of the epithelium on the anterior capsule, and later we have as a result the production from this point of new fibres, and this growth of fibres by itself can bring about healing of injuries in the posterior capsule.

Filaria in the Vitreous.

NAKAIZUMI, PROF., Tokio. (*Deutsche Med. Woch.*, 1903, No. V. P. 186.) N. found at a postmortem a filaria in the vitreous, 7.5 mm. long, 0.17-0.22 mm. thick, which he had diagnosed with the ophthalmoscope.

Histological Changes of Retina and Chorioid in Leukemia.

NAKAIZUMI, (*ibidem.*) A woman, aged 46, suffered from leukemia for four years. Proportion of white to red blood corpuscles 1:5.5, 21 days before death 1:2.7. The ophthalmoscope showed a diffuse opacity above the disc, and a white patch with red margin above, and another below the disc of the right eye. The diffuse opacity was caused by infiltration with leucocytes, the white patches by an accumulation of white blood corpuscles surrounded by a ring of red blood-corpuscles. The layer of the nerve fibers and the fibers of Müller were loosened by cellular infiltration.

Operation for Choked Disc.

KOMOTO, PROF., (*ibidem.*) K.'s method consists in re-

section of the temporal wall of the orbit, according to Krönlein, aspiration of fluid with Wecker's syringe from the optic sheath and irrigation of the vaginal space with physiological Na Cl solution. The ophthalmoscopic picture of choked disc rapidly disappeared, and in one case sight was restored.

Blindness from Methyl Alcohol.

KOMOTO. (*ibidem.*) A patient, who had become blind from ingestion of 100 ccm. of methyl alcohol, showed very marked optic atrophy.

The Chances of Light Therapy in Ophthalmology.

STREBEL AND VON AMMON, München. (*Deut. Med. Woch.* 1903, No. 23.) The authors experimented on rabbits. Exposure from two to three minutes to a lamp, constructed by Strebel, caused changes of the cornea, but no lasting changes. The iris answered with hyperemia, moderate inflammation and transient pigmentation. Retina and chorioid were not altered. Since ultraviolet rays destroy bacteria, a favorable influence of light therapy in serpent ulcer and other ocular affections may be anticipated. Careful adjustment of light has to be observed.

The Results of Iridectomy in Iridochorioiditis.

IMMERMANN, GEORGE, Basel. (*Inaug. Diss.*, from the eye clinic of Prof. C. Mellinger, Basel.) I. reports the lasting results of iridectomy on 180 cases of principally chronic iridochorioiditis, treated at the ophthalmological clinic at Basel from 1870 to 1900. The clinical histories are arranged in tabular form. 60 per cent. were observed in women. Iridectomy acted favorably, as in almost all cases the inflammatory symptoms disappeared and the intraocular pressure became normal. Central vision was improved in 61.90 per cent., useful vision preserved in 28.60 per cent., while in 8.96 per cent. iridectomy had an unfavorable result. Peripheral vision was improved in 6.51 per cent. impaired in 2.12 per cent. Although the curative effect of iridectomy cannot be satisfactorily explained, it cannot be too highly appreciated. Poor results were obtained mostly in very far advanced cases or when complicated by opacities of the lens, detachment of retina or secondary glaucoma.

Contributions to the Knowledge of Sympathetic Ophthalmia.

WINGENROTH, ERNST, Mannheim. (*Beitr. zur Augenheilk*, Aug., Heft 57.) W. reports two cases of sympathetic papillo-retinitis which were favorably influenced by enucleation of the exciting eye, a case of sympathetic neuro-retino-chorioiditis, occurring long after enucleation of the injured eye, and a case of uveitis which yielded unusually well to medical treatment.

CASE I. A deep scleral wound of 3 mm. from the right limbus upward and outward was caused by a piece of a chisel visible with ophthalmoscope, $V=1/60$. Extraction with Hirschberg's magnet. After a week iridocyclitis. Yellow reflex from a circumscribed exudation at the lateral region of the ciliary body; vitreous cloudy, lens clear. V =motion of hand at $1/2$ m. Five subconjunctival Na Cl injections. After six weeks only dim red reflex. After seven months eye without irritation, anterior chamber very shallow, globe flattened at the injured ciliary region. V L, normal. Two weeks later sensation of fluttering in left eye. V and ophthalmic condition normal. After a further week $V=6/12$, V F., slightly contracted. White streaks run over the lower portion of the optic disc and are in connection with a flat exudation inward and downward from the disc, the lower inner quadrant of which shows a peculiar whitish discoloration. Veins dilated. No foci at the periphery of the macula. Enucleation of the right eye the following day. After 6 days V L rose from $6/12$ to $6/6$. Iodide of potash, then injections of strychnia into the temple and Iodeigonnatron. After 11 months $V=6/5$, V F. contracted, optic disc slightly veiled, two small floating opacities of vitreous. The patient still complains of fluttering. The microscopic conditions of enucleated right eye is described.

Case II. A wound 4 mm. long, of inferior lateral quadrant of cornea and iris by a piece of tin, sticking in the latter. Unsuccessful attempt to extract it. It apparently was caught in the crypts of the ciliary body. After 4 weeks dismissed with $V=3/10$. Two months later photopsiae of the other (left) eye, $V=1/2$, optic disc hyperemic. Enucleation of right eye. Two days later V . L. = $5/5$, photopsiae less distressing, optic disc still hyperemic. The eye at first remained quiet, but after a year photopsiae re-

curred. The patient saw objects only half by alternating disappearance of the temporal and nasal halves of the visual field. Intense photophobia, optic disc hyperemic, hemorrhages at the periphery and outward and downward of the disc a whitish exudation of $1/2$ disc's size. Medical treatment being of no avail, the right orbit was evacuated and the stump of the optic nerve resected far back. The disagreeable sensation and hemorrhages disappeared, disc grew paler. To-day $V = 6/6$. Fundus normal, but still some photophobia and fluttering. Case III. Man aged 65, injured his left eye in cutting stones, March, 1897. Enucleation in April, 1898. Since 1899 a continuous impairment of V of right eye, in which he had felt fluttering shortly before enucleation, and did not see as well as formerly. A few days later V had become normal. 1901 he consulted W. Aqueous opaque, iris discolored, numerous floating opacities of vitreous $V =$ fingers at 2-3 m. After three weeks, motion of hand at 1 m. Inunction of mercurial ointment for 4 weeks; atropin, and subconjunctival injections of cyanate of mercury every third day. After 4 weeks, $V = 5/20$. V. F. Slightly contracted, which remained the same ever since. Case IV. Severe injury of left eye February 11, 1887. Enucleation February 16th. Smooth recovery. V. L. normal. August, 1888, the patient returned, stating that for some time his sight commenced to fail. $V = 6/36$, pupil reacted normally. Optic disc slightly reddened and outlines indistinct. Treated at the hospital with diaphoresis. Gradually atrophy of the optic nerve developed with formation of whitish yellow spots and pigment changes of fundus. V. F. excentrically, almost normal, but colors not perceived centrally. A year later $V = 2/60$, and atrophy more marked. 1902 $V =$ fingers scarcely at 1 m. Optic disc greyish white, arterial walls very much thickened.

W. advocates rigid inunction treatment and subconjunctival injections, of which the mercurial injections are preferable to Na Cl in inflammations of the uveal tract. They are only effectual in combination with careful, general and local treatment. W. considers his cases as supporting the hypothesis that the sympathetic uveitis is a bacterial, the sympathetic papillo-retinitis a toxic disease.

Contribution to the Operative Treatment of Congenital Dislocations of the Lens by Discission.

MAYEDA, U., DR., Nagoya, Japan. (From the Eye Clinic of Prof. Vossius at Giessen, *Ibidem*) After a review of the incident literature, M. reports two cases occurring in a boy of 15, operated on by Dr. Komoto, who performed discissions repeatedly with resulting $V = 20/40$ in both eyes, and a boy of 10, treated in some fashion by M. with $V = 6/12$. The result in the right eye was frustrated by detachment of retina after 2 1/2 years. M. advocates careful and moderate discission as the best mode of treatment. Finally he reports a case of spontaneous healing of the congenital ectopia lentis by shrinkage in a boy, aged 8, from the private practice of Prof. Vossius.

Remarks on Dilatation of the Pupil.

SCHWARZ, E., DR. (*Ibidem*.) S. obtained a powerful mydriatic action in cases of recent and chronic iritis by simultaneous instillations of sulf. of Atrop. 1 per cent, Hydrobrom. of Scopolamine 3 per cent., sulf. of Duboisin, 3 per cent., hydroiod. of Hyoscine, 3 per cent., in which he had scarcely expected any effect from mydriatics. They may be used successively or simultaneously in one solution, since no chemical alteration takes place. For temporary, more speedy, mydriasis, he recommends a mixture of hydrobromate of Homatropine and Euphthalmine.

Further Contribution to Amaurotic Family Idiocy, a Disease of Chiefly the Grey Substance of the Central Nervous System.

SACHS, B., PROF., New York. (*D. M. Woch.* 1903, No. 28.) So far 64 cases of this disease are known, which almost invariably occurred in Hebrews. Falkenheim added as further symptoms to the well known clinical pictures: sudden laughing spells without cause and dysphagia, apparently due to the mental and bodily degeneration or to bulbar affections. S. reports a case, occurring in a child, aged 2 1/2 years, who became blind at the age of one year with the typical ophthalmoscopic condition: A cherry red spot at the macula. The autopsy revealed no inflammatory conditions of the brain, only slight augmentation of the neuralgia cells and very marked degeneration of the grey matter of the large ganglia of the brain and spinal cord, which S. considers as the primary affection, due to an arrest of development and secondary degeneration of the white fibres in the anterior and lateral funicles. S. recommends further anatomical examinations of the grey matter of the entire central nervous system in such cases.

ABSTRACTS FROM JAPANESE OPHTHALMIC LITERATURE.

BY

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TOKIO, JAPAN.

TRANSLATED FROM GERMAN MS. BY H. V. WÜRDEMAN, M. D.,

MILWAUKEE, WIS.

(Quarter ending Sept. 30, 1903.)

A Case of Traumatic Nuclear Ocular Muscle Paralysis.

KOMOTO, PROF. J. (*Nihon Gankwa Gakkwai Zasshi*, VIII, 1.) A 4-year-old boy had been injured, 25 days before the author's examination, on the upper left side of his forehead by the falling of a wall clock. but no loss of consciousness or vomiting had ensued. The upper left eyelid was a little fallen, the globe turned outward and its movements upward, inward and downward were lost. The pupils reacted evenly and normally. It was impossible to determine whether diplopia existed or not, but the peculiar position of the face and head of the little patient pointed to this probability. After a month of treatment the position of the head and movements of the eyes became normal, although the ptosis did not entirely disappear.

A Form of Degeneration in Keratitis Punctata Superficialis.

KOMOTO, PROF. J. (*Ibidem.*) Certain cases of keratitis punctata superficialis appear in which the patches have peculiar S or ring shapes. In others the centers become transparent. The following case shows these conditions: A 30-year-old man took a sea bath and the following night had fever with pain in the eyes, photophobia and lachrimation. He could not open the eyes for two days, and then felt as if there were a fog before them. After considerable

treatment these inflammatory symptoms disappeared and vision was restored. Two and a half months after this he was first examined by the author with the following results: V. Both eyes—20/70; no inflammatory symptoms excepting injection of the scleral conjunctiva. In the zone of the palpebral fissure on the cornea, a ring-shaped, superficial opacity 5×8 mm. in area, relatively sharply defined toward its periphery was observed; the central portion merged into a clear area. Many spots, not to be distinguished from the ordinary form of keratitis punctata superficialis could be found both in and outside of the opacity. The other parts of the cornea were clear. The appearances were the same in each eye. Treatment consisting of warm compresses, and Pagenstecher's salve had but slight influence upon the disease, so that V rose in 2 months to 20/40 without change in the appearances.

Sympathectomy.

KOMOTO, PROF. J. (*Ibidem.* VII, 2.) The author has made resection of the cervical sympathetic in 10 cases, of which 8 were for chronic and hemorrhagic glaucoma and one each in Basedow's disease and optic nerve atrophy. In the last named the author hoped to produce a therapeutic effect from the resulting one-sided congestion. The operation could be easily done if the skin incision were made behind the sterno-cleido-mastoid. The result in all cases was negative, but he will try it again in chronic glaucoma. The "material" used in all the operations was otherwise hopeless. The author does not consider the operation as promising as has been claimed by European authors. The symptoms following the operation were slight ptosis, myosis, increase of temperature on the operated side of the face. Enophthalmos and dilation of the blood-vessels were not specially pronounced. The intra-ocular tension was likewise not reduced to any noteworthy degree.

Orbital Phlegmon Following Empyema of the Maxillary Sinus.

OGCHU, DR. T. (*Chugwai Iji Shinshi*, 553.) In 1901 the author saw a one and three-quarters year old boy who for a week had restlessness and fever of about 40° centigrade, vomiting and cramps of the extremities and

for two days protrusion of the right eye. Examination showed: The right bulbus was quite prominent and its movements hindered, the conjunctiva below the cornea was chemotic and the lower lid and the cheek swollen. Pupillary reaction normal. Ophthalmoscopic examination impossible. On the following day the general temperature decreased and the edema of the lower lid became less, while the inner portion showed a fluctuating swelling from which pus was released through an incision. One month from the beginning of the disease the condition was the following: The under lid was red and swollen. Exactly in the lower orbital ridge a fistula could be seen in which there were granulations, out of which a considerable amount of thick, foul-smelling pus was daily removed by finger pressure. A probe passed into this fistula went in 2 to 3 cm. to a spot of eroded bone. In the upper right hand side of the oral cavity a fistula and a carious upper tooth were found. A probe was passed 3 cm. into this fistula, passing into the antrum of Highmore. The general temperature was 38 c. The author then made a 2.5 cm. incision through the fistula of the lower lid and curetted out a mass of necrosed bone. The carious tooth was extracted and the granulation tissue curetted out of the upper jaw. Two days after this operation a sequestrum came out. Further course was uneventful. One and a half years later he saw the case again and the sight was found normal, the right lower lid had a small coloboma and was slightly ectropic, and upon pressure a clear liquid could be pressed out of the old fistula. An irregular rhomboid depression, 2×1.5 cm. extended from the upper wall of the maxillary sinus to the ethmoid. The author thinks that at first there was a dental periostitis which successively caused empyema of the maxillary sinus, inflammation of the lower rim of the orbit and the ethmoid and phlegmon in the region of the lacrimal sac.

Ophthalmoblenorrhoea Eyebaths.

KONO, PROF. T. (*Nihon Gankwa Gakkwai Zasshi*, VII, 3.) The author limits the term of blenorrhoea to conjunctivitis, whose secretion contains gonococci. This he determines by staining with carbol-Fuchsin, which is said by him to be the plainest and most enduring stain. He

uses Gram's method only in *suspicious* cases. Of the 50 cases examined there were 9 in the new born, 6 children and 35 adults. Gonococci were found on the average in the secretion in Bl. neonatorum, 37.0 days; in Bl. infantum* 35.8 days; in Bl. adutorum, 20.8 days.

In the newborn and in children the course is much more favorable than in adults, in 34 of which corneal complications occurred, which happened only once in the case of infants and the new born. Treatment recommended by the author is an eyebath used in the form of a spray of 3 per cent. boric and 1 per cent. salt solution. Sublimate is here contraindicated as it causes eczema of the lids. The eyebath is used from the beginning of the affection 3 to 6 times a day, according to the gravity of the case, for 30 minutes each application. The eye may also be washed out every half hour by boric or sublimate solution. For the stage of pyorrhea, the author esteems nitrate of silver the quickest, but not a specific treatment. The eyebath can be used only in adults and larger children and on account of the milder course of the disease in infants it is unnecessary. This form of treatment is esteemed by the author to give ideal results, as it removes the secretion easily by help of lid contractions and assists nutrition of the cornea by restoration of the circulation.

*This term (Blenorrhoea infantum) was recommended by Michiyasu Inoue in the *Centralblatt für Praktische Augenheilkunde* in 1898 for this special form of blenorrhoea.

ABSTRACTS FROM DUTCH OPHTHALMIC LITERATURE.

BY

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ASSISTED BY

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(Quarter ending Sept. 30, 1903.)

The Ultimate Effect of the Operation for Strabismus (Illustrated).

VISSER, J. P. (*Doctorate Thesis*), examined 86 of the dispensary patients, on whom Prof. Straub operated during 1895-1903.

Tenotomy was performed after V. Graefe's method, without lifting the conjunctiva from the underlying tissue and leaving the connective tissue over and beneath the tendon intact as much as possible. A buttonhole is made in the deep fascia over the tendon, through which the strabismus hook is introduced. The tendon with its fascial insertion is cut as near as possible to the bulb. The conjunctiva alone is stitched.

The advancement was done after Lagleize's way of folding the muscle, mostly with very good results. Sometimes Knapp's method with three threads was followed. Later an ordinary transplantation was done with one thread after Lagleize; its action was too weak, but became sufficient when a small piece of the muscle was resected.

The 86 cases were operated as follows: Single tenotomy, 13; double tenotomy, 41; single tenotomy with one advancement, 13; double tenotomy with one advancement, 7; double tenotomy with two advancements, 9; two advancements, 3. The success was very satisfactory in 79 cases; a very small deviation was present in 2; a large part of the original squint remained in 4 cases and a decided over-correction resulted in one case. The correct position was mostly combined with demonstrable binocu-

lar vision (31 cases), however 12 cases showed correct position, but binocular vision could not be proven, which does not mean that it was altogether absent. Not all cases, where binocular vision resulted, showed constantly parallelism; this alternates with a very small deviation in 20 cases with binocular vision. The fall experiment of Hering is used for the determination of binocular vision; with those who tire easy groups of ten observations are done. The graduation was done through the choice of the operation method. All double tenotomies were done in the same way, viz.: cutting of the tendons, respecting as much as possible the connection of the muscles with the surrounding fascia; still the effect varies between 10° and 40° . This demonstrates clearly that not the surgeon but the patient graduates. The caruncle was found sunk in 57 of the 86 cases; this deviation was mostly of little inconvenience, as mostly both sides were operated. However, the sinking in was in a few cases too deep. The combination of tenotomy and advancement seems to be more favorable for the caruncle; 13 cases, where one tenotomy and one advancement, and 9 cases where two tenotomies and two advancements were performed showed 11 times drawn in caruncles, while 41 times the caruncle sunk in out of the 54 cases where tenotomy was performed. The eye cleft enlarged twice, once insignificantly; the second case was repaired with a second operation.

In eight cases the vision increased, although not much, after two tenotomies. The vision of the weak eye increased:

Twice from 0,5 to 1			
Once from	$\frac{1}{3}$	to	$\frac{1}{2}$
"	"	$\frac{1}{6}$	" $\frac{1}{4}$
"	"	$\frac{1}{10}$	" $\frac{1}{6}$
"	"	$\frac{1}{4}$	" $\frac{3}{4}$
"	"	$\frac{1}{300}$	" $\frac{2}{60}$
"	"	$\frac{1}{60}$	" $\frac{4}{60}$

In cases examined after 1900 excentric fixation had become 4 times central out of the 31, while in one case the excentric fixation remained. In spite of the restoration of the binocular vision increase of vision of the weak eye remained an exception. The innervation for lateral motion, therefore the adduction of one eye, was very satis-

factory, but the convergence showed difficulties. The convergence was in 49 of the 86 cases undisturbed, in 36 cases slow or decreased, in one case lost. Converging to the lifted finger the converging movement tarries or is lazy in a little less than half of the cases; only a shining object or something unusual prompts the convergence; the patients don't suffer any inconvenience.

The good result of the double and even of the single tenotomy teaches us that the advancement as extensive as Landolt suggests is unnecessary. The observations of the sinking in of the caruncles show that in medium degree of squint a single operation can induce deformity by making the caruncles unequal, and that double tenotomy is less to be recommended with high degrees of squint on account of the threatened sinking in of the caruncles.

Astigmatic Accommodation Following Local Application of Homatropin and Eserin.

BRANDES, S. (*Doctorate Thesis*), tried the possibility of creating an unequal increase of curvature in different meridians of the lens. Brandes does not consider the astigmatism, which Botwinnik pretends to have proved, to be astigmatism, or only a very small part, as he tried to demonstrate lens astigmatism without taking into consideration accommodative action in the eye. The unequal refraction, found by B., must be considered as an unequal focussing of the entire eye at the different times of determining the refraction. Also observation mistakes must be accounted for. Botwinnik found when paralyzing astigmatism according to the rule, that the paralysis began in the horizontal meridian, so that the astigmatism increased. Botwinnik declares now that the lens would correct the corneal astigmatism (especially in hypermetropic astigmatism), which would be impossible in atropin. Brandes believes that seeing in dispersion figures is much less difficult when they are horizontal than when vertical.

Brandes used the instrument described by Hess (v. Graefe's Arch. XLII. 2, 1896, p. 80). The silk threads were replaced by threads spun by spiders round their eggs. Accommodation in the dark room was very difficult for the patients; especially was this so with the hematropin experiments, so that Brandes had to take the test

types of Snellen and let the patient read in daylight at the nearest distance to the eye. It was impossible for Brandes in contradiction with Hess to determine the punctum remotum. Only healthy eyes were used, emmetropic, slightly myopic, not too strong hyperopic and astigmatics not higher than 1 to 1,5 D.

After determination of the refraction and accommodation the patient was placed before the instrument to measure the astigmatism with the accommodation relaxed as much as possible. With astigmatism according to the rule the threads were placed so far from the eye that the vertical lines could still be seen sharply. Then the horizontal thread was moved away, until it was seen as sharply as, and at the same time as the vertical. Ten observations were taken. This same was done with the accommodation as strong as possible. If the difference with relaxed accommodation was more than 0,25 D. then the patient was considered unfit for such an observation. Smaller differences were considered mistakes of observation. After this preliminary examination a small grain of homatropin was put with a piece of cotton on a point, mostly the highest point (vertical meridian) of the corneoscleral junction. The upper eyelid was pulled upward and the patient incited to look downward. The homatropin could so act locally from 5 to 10 minutes after which the nonresorbed homatropin was wiped off. It was evident that a local action took place from the pronounced disfigurement of the iris. After application of the homatropin the patient was again placed before the instrument and now, with small intervals, the astigmatism was measured with accommodation relaxed, moderate and as strong as possible. Often this was combined with observations with lenses and with reading tests. A total paralysis of the accommodation was almost never reached with the homatropin, often only a paresis of 3-4 D.

Before applying the eserin the conjunctiva was made senseless with a 2 per cent. cocain solution; then that spot was touched with a little eserin in substance. Little time was needed, as resorption went on quickly. With eserin a maximal accommodation is possible, even when no remaining accommodation spasm is present. 28 patients were examined.

Brandes could demonstrate an astigmatic accommodation after local application of homatropin or eserine on the muscle ciliaris. The meridian, corresponding with the place of the corneo-scleral junction, where the topical application of homatropin or eserine took place, is weaker during accommodation. Astigmatic accommodation after local application of homatropin reaches seldom more than one dioptré, after local application of eserine it can reach 2 to 2,5 D., but as a rule does not exceed 1D. With an increased tonus of the ciliary muscle after the local influence of eserine; lens-astigmatism is observed in far less cases, than with the accommodation after local application of eserine. The possibility of astigmatic accommodation during the influence of homatropin or eserine lasts only a short time; then the alkaloid spreads quickly through the entire ciliary muscle. While this influence is retrogressing no lens-astigmatism can be excited. Astigmatism after the local application of the homatropin shown during accommodation does not depend on enlargement of the pupil; while the near approach of the punctum proximum after applying eserine does not depend on the very small pupil.

Stereoscopic Vision.

NICOLAI, C., treats chiefly of the significance of accommodation and convergence for depth measurement. He finds the theory of Parinaud for stereoscopic vision unsatisfactory. N. concludes that the perception of relief arises from the unequal size of the angles of projection; that the isolation of the objects originates from the subjective perception of double images and that convergence produces the depth measurement.

The depth perception depends upon the localization of the binocular images in the crossing points of the projection-axes as well in the chief-axes as in the side-axes (Giraud-Teulon). N. finds that the accommodation makes the depth perception in paintings more difficult, as more perspective is seen with positive lenses; also more depth is observed with one eye than with both, as the disturbing influence of the accommodation makes itself more felt with binocular vision.

The Examination of Color Perception in the Royal Dutch Navy.

BLOK, D. J. (*Med. Weekbl.*, Aug. 16, 1902), refers to the royal decree of Dec. 21, 1883, according to which the color perception for volunteers of the army and navy must be examined alone qualitatively, with Stilling's pseudo-isochromatic cards and Holmgren's or de Bull's method. However, it is clear that only Daltonism will be detected; that the central relative color scotomata (mostly red and green) will escape, which is of the utmost importance with sailors. Cases with small relative scotoma for red and green can have sufficient distant vision, and will be able to read all Stilling's tests. On the other side a person with central scotoma should not be rejected as a Daltonist. Blok refers now to Broca's article: *La Vision de Signaux Colores*. *Anales d' Ocul.*, April, 1902, and mentions that Donders constructed a similar lamp years ago. D. put a normal candle behind a screen, in which was an opening of 25 mm., which can be closed with ground glass. Before the opening a metal plate can be moved with different holes, of 1, 2, 5, 10 and 20 mm. diameter. Directly behind the opening a movable disc with red and green glasses was put. Normally red must be distinguished at 0,65 M. distance with the one mm. opening; for green the distance was 0,25 M.

Blok recommends strongly the instrument of Donders or Broca, and the examination often, especially pilots once every year. This examination can only be done satisfactorily by specialists.

A Case of Monocular Blindness Through Hystero-trauma.

STOCKE, E. (*Med. Week bl.*, Oct. 25, 1902), at the 6th Flemish Medical Congress at Kortryk, Sept. 27, 28, relates the following case. After a historical review of the pathological symptoms, resulting from traumata, demonstrated that the theory of Charcot cannot be accepted in full, but that we might expect chemical changes in the cells of brain and spinal cord through a strong emotional and material shock. S., was consulted by a 31 year old farmer in May, 1899, who complained of being blind in his left eye. Family history negative, except that two sisters suffer from nervous trouble and one brother from nervous loss of

voice. Two weeks ago while thrashing, a grain flew in the left eye, hurting him considerably, causing photophobia and epiphora. Somewhat later closing the right eye he finds the left one blind. He became at once very excited, went home crying, "my eye is lost." S. found pupil and light reflex normal. Vision — O: Vis.; right eye = 5/5. Fundi normal. Skin of the eyelids, conjunctiva and cornea at the left side senseless, faucial reflex lost. With the left eye looking at the sun patient saw nothing. Patient's disposition of mind was peculiarly given to much exaggerating, complaints of headache, etc. Simulation could be excluded. A psychic treatment with amber cured.

Dr. Bauwens relates the history of his own tear fistula. A dacryocystitis, following an acute rhinitis, was treated with sounds; later cauterization of the sac with zinc chloride, whereafter a fistula remained. Then the puncta and canaliculi were burned without result. A cicatricial sinus in the cheek was formed by the tears. Then the lacrimal gland was removed. Now an ectropion and blepharoptosis are present, the conjunctival glands keep the eye so wet that cotton is worn at the inner canthus.

The Complete Correction of Myopia.

BYLSMA, DR. R. (*Med. Weekbl.*, Dec. 20, 1902), gives first the rules laid down by Donders and then mentions the communication by Pfalz in 1901, strongly supported by Heine. However, Förster, in 1885, and Risly in 1903, maintained that complete correction of the myopia in youth would be a powerful aid in combatting its progression. Hess and Heine demonstrated that the accommodation does not change the interocular pressure, but convergence increases it, so the near point for distinct vision must be removed from the eye.

Dr. Bylsma criticises the value of large statistics, as it is impossible to control all the patients, regarding their following up of our advice, their habits, the amount of their work, etc. Small statistics of patients who have been entirely controlled, have far higher value. B.'s own myopia which originated after his 19th year, increased with nose-glasses, until he began wearing nearly full correcting spectacles at 25 years; he changed these at 40 years for

noseglasses. In the beginning his myopia reached R. E. 2,5 D. and L. E. 3,5 D.; his first spectacles were 2,5 D.; as however the myopia of his L. E. increased till 4,5 D., he corrected this fully, and since there was no more increase. He had read much but looked carefully after his attitude; outdoors he exercised his distant sight: his advice for all his nearsighted patients.

He used to correct young myopes under 6 D. completely. If the accommodation in the beginning was somewhat difficult, he gave in as little as necessary and as long as it could not be helped; always spectacles. For myopia of 7 to 13 D. spectacles for continuous use, but 1 to 3 D. weaker. Only myopes older than thirty years could use nose glasses. The first 20 young myopes, of which he knew had followed up his advice and worn the spectacles continuously, and which he had followed up, he comes to the conclusion that full correction and the continuous wearing of the spectacles in youth in no decisive way prevents progression. Four of the 20 remained stationary, but those 4 quitted school and asked little from their eyes. The average time of observation of the others is 3 to 5 years and the progression 1 to 4 D. Full correction then is no preventive of increase.

The Perception with the Single Retinal Cone.

SCHOUTE, [G. J. (*Weekbl. v. Gen.*, July 5, 1902), found that Laan had stated in his dissertation (see *Annals of Ophth.*, 1902, pp. 562-5), that the quantity of light is the chief factor for perception, when the images cover more than one cone, but that this peculiarity ceases, when the images become so small, that but one cone is irritated. Schoute had just stated the opposite, namely, that the product of size of image and illumination gives a constant perception with one single cone; a large object poorly illuminated seems to be as large as a small object strongly illuminated. He took objects of known size and illuminated them with known intensity, arranged so that the retinal images did not cover more than one cone, he found that the sensation depends only on the quantity of light which the cone receives. It is unnecessary that this quantity is spread over the whole cone; a large object

feebly illuminated will seem as large as a small object, if it is more powerfully illuminated, or if it is longer visible than the other. So two objects of the same size, apparently unequal on account of the different illumination, will seem equal when the less lightened object is longer visible than the other. The sensation is always the same when the product of the size of the image, of the light intensity and the duration of the observation is constant.

The Function of the Red-Purple.

PINO, C. (*Weekbl. v. Gen.*, July 19, 1902), reports two observations. First he had his eyes for 3 minutes in a darkness as complete as possible. Then he directed his gaze on a well lighted landscape, opened his eyes, removed the bandage, stared at the landscape for 2 seconds, closed directly his eyes covered them with his hands and observed a beautiful positive after image, which was colored carmin red during the first 5 seconds, after which it took the normal color of the landscape. Second he closed his eyes during 3 minutes in diffuse light, repeated the above observation and saw the positive after image with the same distinctness although all the time in its normal color. During the first experiment red purple in excess had formed, which was prevented in the second case by the light penetrating through the eyelids. The red purple neutralises the yellowish green color from the capillaries (See ANNALS OF OPHTH., January, 1903, p. 187).

A Case of Double Coloboma Chorioideae in the Macular Region.

HOEVE, J. van der., examined a 11 year old girl with this defect; V. O. D. 6/36, O. S. 6/36; slight improvement with — 2 D. Central fixation. Media clear; in the anterior cortex of both lenses a small dotlike opacity. In the left eye a large chorioidal defect was seen as a white spot. 2 P.D. to 1.5 P. D. large, on the horizontal meridian of the papilla at a distance of 1.5 P. D. of the entirely normal papilla. It is surrounded by pigment; its color is glistening white and its large vessels do not communicate with the retinal vessels. Refraction with the ophthalmoscope of the centre of the coloboma M.=3 D., while that of the papilla is H=1. D. A similar white spot is found in the

right eye at a distance of 2 P. D. from the papilla and a little lower, its centre is myopic 2 D. while the papilla is $H = 0.5$ D. The field of vision does not show a scotoma corresponding to the coloboma, while the blind spot is demonstrated on its normal place; only in the left field, to the temporal under side, a scotoma of a size smaller than 1 P. D., at a distance of 1 P. D., of the fixation point was found, that is also much smaller than the existing coloboma. A pretty good functioning retina covering the coloboma must be supposed. The field of vision is constricted for white light and colors. The vessels in the coloboma were most probably arterial. The origin of these changes is most probably an intra-uterine inflammation with secondary giving way of the weakened places.

A Rare Case of Morbus Barlowii.

NICOLAI, C. (*Tydschr. v. Gen.*, Oct. 4, 1902), observed a case, where he as ophthalmologist made first the diagnosis. A 9 months old child came with protrusion of the left eye and a few yellow-greenish spots on the upper eyelids. Two days after hypopion-keratitis, which was caused by insensibility of the cornea; probably the child had scratched himself (Keratitis neuroparalitica) as it often rubbed its eyes. The gums of the incisor teeth were swollen and of a blueish color. In a few days a hemorrhage in the right orbit, which swelled chiefly the upper eyelid. Change of diet gave quick recovery. Local treatment cured the left eye, while small corneal spot remained. N. supposes in the left orbit a subperiostial hemorrhage in the back part going toward the fissura orbit. sup., perhaps until in the brain cavity; in the right eye the hemorrhage was more forward. Exophthalmus was observed 46 times in 372 cases of M. Barlowii. This is the only case, where protrusion was the first symptom.

Neuritis Following the Use of Thyroid Powder..

AALBERTSBERG, G.. (*Tydschr. v. Gen.*, Nov. 29, 1902), found myxedema in a female patient, 58 years old, which seemed to have begun with the menopause at her 50th year. After she had taken powdered thyroid gland for a month, a veil came over the left eye; vision diminished rapidly and a week later light perception was lost.

The optic nerve head was diffuse pinkish, the veins tortuous and enlarged, the arteries small: Neuritis optica with dispersed white spots. The vision of the right eye also diminished to 5/15 with H=4.5 D. color perception good; ophthalmoscopic changes the same but less than in the left eye. No other cause than the use of thyroid gland could be found, so this was stopped and iod. of pot. administered (1.5 d. d.). Some two weeks later patient went home; the ophthalmoscopic aspect of the right fundus was normal, V. O. D.=5/10; beginning atrophy of the optic nerve was found in the left eye, V. O. S.=O. Condition the same a month later, only more pronounced atrophy.

ABSTRACTS FROM AUSTRO-HUNGARIAN OPH- THALMIC LITERATURE.

BY

J. GUTTMANN, M. D.

NEW YORK.

(Quarter ending September 30, 1903.)

Muscae Volitantes.

BUCH, MAX. (*Medicinisches-Chirurgisches Centralblatt* July 3, 1903.) If we look with half closed eyes toward a uniformly lit surface such as the sky or an illuminated cloud, we can see, entoptically, certain formations, probably in the vitreous humor. The skeleton is a veil-like texture consisting of a row of cylindric threads, from 8 to 12 in number, and in certain intervals a number of globules, usually from 4 to 6, situated closely together, and perpendicularly to the threads. The threads show a central light streak with broad dark margins; the globules also have a very bright center surrounded by a broad dark ring.

In an entirely new texture the direction of the threads is almost perfectly perpendicular, and the row of globules horizontal. As the eye moves along, these veils appear as if they were folding. After sleep we can always see new veils, which later on moving the eyes seem to tear in longitudinal and lateral directions. These floating particles may be seen in every direction; some appear as threads with globules attached to them, others just as plain rows of globules. When these threads become entangled and twisted they form knots which can be seen with open eyes as floating opacities; these opacities can also be seen with closed eyes provided the lids are sufficiently illuminated with good dispersed daylight.

As new veils appear daily and then again are torn, we may assume that they are in close relation with the physi-

ological function of the vitreous. They are found in every individual, but they are more distinct in myopic than in emmetropic eyes. It is questionable whether they have any other pathologic significance.

The Chalazion Bacillus and its Relation to the Korynea Bacteria.

HALA, (*Weiner Medicinische Presse*, July 5, 1903) 1. Chalazion is etiologically an infectious bacterial process. 2. The numerous bacilli which are constantly found in a beginning chalazion are identical with the Korynea bacteria—the xerose bacilli described by Kuschbert, Neisser and Leber. 3. The xerose bacilli, which are found in the normal and particularly in the pathologic conjunctival sac enter the conjunctival tissue by the friction of the eyelids forming an acute purulent infection which later becomes a chronic granular tumor. 4. Predisposed factors are catarrhal affections of the conjunctiva and all kinds of asthenopia. 5. Contrary to the opinion of Baumgarten and others who do not attribute any virulent character to the xerose bacillus, is the fact that we can produce experimentally a chalazion on the lids of rabbits by xerose bacilli. 6. New xerose bacilli can be obtained from the cultures of experimentally produced bacilli and their properties will remain unchanged. 7. In conclusion he states that the chalazion is not a retention cyst caused by obstruction of the excretory ducts of the Meibomian gland. 8. The chalazion has no relation whatsoever to tuberculosis.

Complete Blindness Caused by Necrosis of the Sphenoidal Bone.

POLLATSEK ELENICE. (*Pester Medizinisch Chirurgische Presse*, July 12, 1903.) From the anatomic situation of the parts involved it is quite obvious that an affection of the sphenoidal antrum may have a considerable influence on the power of vision. The optic nerve which lies in the foramen opticum is in such close contact with the thin wall of the antrum, that a suppurative process of the sphenoidal antrum extends very easily to the optic nerve, causing its atrophy. The atrophy, as a rule is only unilateral. Atrophy of both nerves is very rare, and is observed only in cases where the destruction of bone is

very extensive. The cause of the destructive process is syphilis as a rule.

The author then describes the following cases: A patient 30 years of age was suffering for 15 years with severe headaches which were localized in the occiput. Four years ago his nose became affected, and small spicule of bone were exfoliated; three years ago his vision became impaired and in a short time he became totally blind. Examination of the eyes showed: *Synechia posteriora oculi dextri, maculae cornea, atrophie nervi optici et neuritide oculi utriusque*. Examination of the nose showed the mucous membrane covered with dry odorless crusts; the septum, with the exception of a small part of the cartilaginous portion, was entirely absent; of the turbinated bodies only narrow borders remained. After cleansing the nasal cavity, a small amount of fresh pus was seen to exude on the right side, near the opening of the sphenoidal antrum; the probe entered a small cavity passing through the softened middle wall; and by directing the probe toward the left side soft bone was also encountered. The patient was subjected to a rigorous antiluetic treatment.

Affections of the Eye Caused by Scurvy.

WEIL, GEORGES. (*Wiener Medizinische Presse*, July 19, 1903.) Affections of the eye in scurvy are some of the rarest complications of this disease. In the 17th and 18th centuries, bleeding in the conjunctiva was mentioned for the first time as a complication of scurvy.

The writer examined, during an epidemic of scurvy in a prison, the eyes of 61 patients afflicted with the disease. In 5 cases he found complications. Ordinarily bleeding of the conjunctiva or the lids or other affections of the exterior of the eye are observed, but the author found in his cases affections only of the interior of the eye. In 3 cases there was found neuritis optica and in 2 cases retinitis ad maculam. With the exception of one case of neuritis optica all recovered completely without any local applications or treatment of the eyes.

A Case of Choked Disc After a Successful Operation for an Abscess of the Brain.

SACHSALBER, A. (*Wiener Medizinische Presse*, July 19,

1903.) Before the operation there was a hyperemia of the optic nerve but no choked disc; six days after operation, however, there was a typical picture of choked disc. For a few days the condition of the optic nerve remained stationary, and only after six weeks the nerve became normal again. No functional disturbances were present during the entire process.

There are two theories as regards the formation of choked disc, the mechanical (Schmidt-Rimpler, Mantz) which is based on a primary intracranial increase in pressure, and the chemical, phlogistic theory (Leber, Deutschman). This case speaks for the production of the neuritis rather by toxic means, because the mechanical element was eliminated by the opening of the abscess, and notwithstanding that the neuritis optica was considerably increased.

Changes in the Eye Caused by Lightning.

STILVARK (*Wiener Medizinische Wochenschrift*, July 25, 1903.) A woman was struck by lightning, and when she regained consciousness she complained of pain in the eyes and photophobia. The examination of the eye showed scorched eyelashes, a left hazy cornea and chemosis; the pupils were uneven, there was spasm of accommodation, pressure on the corpus ciliare was very painful and the papillae were hyperemic. Three days later, a stellate opacity in the posterior pole of the lens was formed, after three weeks the opacity began to clear up, and six weeks later had entirely disappeared. The author considers all these changes to have been caused by the ultra-violet rays of the lightning.

Myopia Caused by Diabetes Mellitus.

NEUBURGER. (*Wiener Medizinische Wochenschrift*, July 25, 1903.) Diabetes Mellitus causes sometimes the following affections of the eye: cataract, retinitis, neuritis optica and paresis of accommodation. Myopia caused by diabetes is of quite rare occurrence, and the author considers it of sufficient importance to report the following two cases:

1. A woman 50 years old until 4 months ago had nor-

mal power of vision and with +2 D was able to read the smallest type, complained that lately her vision "in distance" became considerably diminished, but that she was able to read nearly without glasses. Examination showed a right myopia of 1 D, and a left myopia of 2 D; with the ophthalmoscope nothing abnormal could be seen. The urine contained 3.5 per cent. sugar. Antidiabetic diet had no effect on the percentage of sugar but the myopia disappeared in three weeks.

2. In the second patient the myopia gradually increased to right 3 D, left 8 D.

Diabetic myopia is usually considered to be caused by changes in the lens, and inasmuch as it is well known that myopia appearing in old age is often caused by the beginning of cataract, it is highly probable that many cases of diabetic myopia are produced in the same way. Another cause might be an increased index of refraction in the lens, and Heine was enabled to prove an increase of the index by direct measurements of a clear lens. These changes are obviously caused by disturbances of nutrition.

We should, therefore, always bear in mind the possibility of diabetes in a case of myopia which sets in suddenly in old people in whom the media of the eye are clear.

Rupture of the Optic Nerve.

SALZMANN. (*Wiener Medizinische Wochenschrift*, July 25, 1903.) This injury consists in a solution of continuity of the optic nerve in the plane of the lamina cribrosa, and is of very rare occurrence, there being only eight cases reported in literature.

The history of the case is as follows: A young man shot himself with a revolver in the right temple; examination after 12 days showed in the left eye only suffusions of the lids, but in the right eye there was edema of the lids, and the movements of the eyeball were very limited. The ophthalmoscope showed an opening in the papilla; in the vicinity of this opening the retina was missing and there were large extravasations of blood; the border of the opening could be seen with a +3 D convex lens, the

depth of it with a concave 9 D lens. This difference of 12 D corresponded with an opening of 3 mm. In the succeeding 5 weeks this opening shrunk to one third its size, and was replaced by connective tissue. Rupture of the optic nerve may be caused by trauma induced by a blunt object on the orbit, such as an umbrella, a horn of a cow, a rod, etc., or by a shot from a revolver against the temple. The author considers this injury not a direct effect of the trauma but an indirect sudden traction on the nerve, thereby causing its rupture in the scleral aperture.

ABSTRACTS FROM SPANISH AND PORTUGUESE OPHTHALMIC LITERATURE.

BY

ALBERT B. HALE, M. D.,

CHICAGO, ILL.

(Quarter Ending September 30, 1903.)

Asthenopias and Congestion of the Papilla.

ASCUNCE, Pamplona (*Archivas de Optalmologia*, June, 1903), reviews the various causes of refractive eye trouble, ametropia, astigmatism, muscular anomalies, accommodation, convergence, ill health, impaired nervous system. He recalls Trousseau's success in opening the lacrimal passages for asthenopic relief. He cited as a common symptom a congestion of the disc and the retina, headache, etc., and lays stress on his opinion that the retina (and disc) may advance or recede according to its refractive state, thus causing an artificial hypermetropia. He accepts Nicolai's theory of a new muscle affecting retina and nerve head. If this be proven true, it furnishes us with a positive objective symptom and sign of asthenopia—papillary congestion.

Granular Conjunctivitis Treated by Expression.

PARTILLO, Valencia (*Archivas de Optalmologia*, July, 1903), declares that the best treatment for trachoma is expresssion. He has devised a new forceps for the purpose which he thinks better than Knapp's or Kuhnt's. They are stronger, but more like the railway punch, and crush as well as squeeze the granulations.

Continuous Irrigation for the Eye.

PARTILLO, Valencia (*Archivas de Optalmologia*, July, 1903), devised a lid retractor combined with irrigating

outlet or inlet (like Noyes' or Laring's) and with this instrument he practices continuous irrigation in cases of pronounced suppuration, using solutions of various drugs and strengths.

Injectons of Fat for Prothesis.

BARRAQUER, Barcelona (*Archivas de Optalmologia*, July, 1903), explains his method of treating an eye after enucleation. He considers the conjunctiva as bounding a cavity (like a sponge) in the meshes of which fatty (or other) tissue will grow. Paraffin or vaseline is not true fatty tissue. Fatty tissue is well adapted to develop when nourished by the abundant blood supply of the orbit.

His technique is as follows: Before section of the recti muscles each is caught up by a thread so that they can be united afterward. Then an ordinary enucleation is preformed and in the place of the globe he inserts a lump of fat taken from the gluteal region, supporting it there while the muscles and mucous membrane are stitched about it. The strictest asepsis is necessary. The results are excellent.

Comparative Value of Optometric Type.

CHACON, Mexico (*Anales de Optalmologia*, June, 1903), examines the various test charts of Snellen, Wecker, etc., finds them practical but not altogether scientific. Vierordt uses a false principle and Nicati's are more devised for photometric registration than for common tests. The most scientific idea is that proposed by Sulzer to have optometric angles measured on the arc of a circle divided according to the decimal scale instead of according to the usual method of degrees and minutes and seconds.

MONTANO, Mexico, in continuing the discussion (*Anales de Optalmologia*, July, 1903) proposes and devises a test chart (illustrated in the same number) based on the above principle of the decimalized circles such as the French Government will use after 1903. He reckons for a distance of 5 meters and named establish a new expression for V the S. or Gonus = the determined decimal length of the circumference computed according to the retina ability of differentiation. The chart is thoroughly practical.

Burn with Caustic Potash.

ALONSO, San Luis Potosi (*Anales de Optalmologia*, June, 1903), reports a case of burn with caustic potash in the left eye of a man 38 years old. He first saw the patient 15 days after the injury. The right eye had been lost in youth. The cornea (left eye) had been destroyed by caustic and the mucous membrane had become cicatricial tissue. Strange to say, the right eye could still perceive light (a blow had caused a leucoma adherens) and after an iridectomy with the extraction of lens it was found that this eye had become highly myopic. That the myopia was due to the trauma can scarcely be doubted, and the reporter inclines to the belief that the myopia was neither dislodgment of the lens nor keratocomus but a general weakening of the ocular tissues which resulted in prolongation of the eyeball.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

CASEY A. WOOD, M. D.,

CHICAGO.

(Quarter Ending September 30, 1903.)

Rapid Operative Treatment of High Grade Myopia.

BASSO, D. (*Annali di Ottalmologia*, XXXII, No. 5-6, 1903.) Basso's technique includes preliminary discission of the crystalline lens, an incision in the upper part of the cornea, 6 mm. in length, and extraction of the lens. The eye must be thoroughly under the influence of atropin for several days previous to the operation. General narcosis is inadvisable as it is important to have the intelligent coöperation of the patient, and to avoid pressure from the fixation forceps while the extraction is being done. He has in this way treated seven patients, and claims for his method the advantages of a much shorter course of treatment than by other plans, a smaller number of operations and the elimination of secondary cataract and its complications. He generally restricts it to patients between 15 and 30; under this age general narcosis is necessary, while over 30 discissions might be difficult in the case of hard nucleus. If there is even partial fluidity of the vitreous operative treatment is contraindicated. It is applicable only to cases in which the parts are sound and the myopia has not yet caused changes in the vitreous. The large number of cases of detachment of the retina that have followed various operations for myopia is due to the fact that the indications have not been limited within strictly scientific bounds. The conditions of the vitreous should be the guide. Myopia rapidly developing to a

high degree should not be operated on as it is especially in these cases that the vitreous becomes disorganized early. Any operative method which is accompanied by or displaces any of the vitreous mass is liable to produce conditions predisposing to detachment of the retina, and the absence of pressure in extraction of the lens is one of the most favorable features of his technique. Even in cases in which the vitreous unexpectedly proves to be partially fluid, the opening made by the writer is so minute that very little fluid escapes, although special care is necessary in these cases.

The cocainization of the eye must be perfect, and if necessary renewed, repeatedly. The blade of a Knappknife needle is inserted through the pupil at the outer end of the horizontal meridian, and using this point for a fulcrum, the lens is cut up and down again and again, then across until the lens, especially the nucleus, is reduced to fragments. This instrument is then laid aside and a linear incision made in the cornea, 6 mm. long, 2 mm. from the margin of the cornea, perpendicular to its vertical meridian. It is advisable to use an instrument with a blade whose cutting edge is no longer than 6 mm. The blade is then slowly withdrawn, pressing down with it the upper lip of the wound, through which a certain portion of the lens escapes while at the same time the pupil is not interfered with. Forceps and speculum are now laid aside, and the patient is allowed to rest for a few moments. A drop of cocain is then instilled, and the operator proceeds to the extraction of the lens. Opening the lids with the fingers and telling the patient to look down, a Daviel scoop is introduced into the pupil, pressing down with the back of the spoon the upper margin of the pupil. The substance of the lens is then scooped up *in* the spoon, as it were, and finds its way out through the groove in the instrument. The duration of this maneuver is largely determined by the ability of the patient to hold his eye quiet and to look in the direction imposed.

The Daviel spoon is inserted three times, allowing a brief rest between each act during which the closed lids are bathed with some warm applications. A fresh spoon is taken each time. The instrument, should rest on the iris at a tangent to the plane of the pupil, and when

first introduced should be passed into the broken up mass of the lens, but after the first time this should be avoided, for fear of rupturing the posterior capsule. By these means the greater portion of the crystalline is removed, especially the nuclear portion. The eqatorial portion may remain *in situ*, as well as possibly, a few layers of the posterior cortical part. The eye is then bandaged and kept under the influence of atropin. The patient stays in bed for the first 24 hours. The anterior chamber will then be found to be deep, the pupil dilated and both filled with lenticular remains. The reaction to the operation is trifling and the rest of the lens matter is rapidly absorbed. In two weeks the pupil is generally almost unobstructed and the patient commences to enjoy the benefits of the operation. If the extraction has been insufficient the anterior chamber will be full of cataractous fragments, and there may be pain and pericorneal injection. In this case the wound in the cornea should be opened, not later than the third or fourth day, before cicitrization has commenced, and the masses filling the anterior chamber removed. Owing to extensive laceration of the anterior capsule, absorption proceeds rapidly and generally without the formation of a secondary cataract. The cure is complete in eight or nine weeks, or even less. It is possible, however, that secondary cataract may occur as a late process just as after an operation for senile cataract.

Demonstration of Elastic Fibers in the Cornea of Certain Mammals.

COLOMBO, G. (*Annali di Ottalmologia*, XXXII, No. 5-6, p. 383, 1903.) Colombo announces that there are in the cornea of the ox numerous fibers which stain electively with orcein. Some of them, with a wavy outline, present the characteristic appearance of elastic fibers, while others pursue a straighter course. These fibers are larger and more numerous and take the stain better in the vicinity of the periphery of the cornea, than elsewhere but their presence can be positively demonstrated even in the center of the cornea. Where the fibers are most numerous and they have taken the stain best, it can be seen that they form a regular network, whose meshes suggest parallelograms or triangles. The membrane of Descemet

takes the stain more intensely than the fibers, sometimes appearing almost black. Comparing the results of the orcein stain with those obtained by preliminary swelling of the tissues with sodium hyposulphite, it is seen that the fibers differentiated by orcein are more delicate, generally speaking, than those brought out by the Tartuferi technic. However, he is convinced that the fibers in the cornea of the ox which stain with orcein are the same which are brought out by Tartuferi's silver process. He bases this assumption on certain particulars common to the fibers in both methods of research, their mode of dividing and crossing each other.

Pathologic Anatomy of the Arcus Senilis.

VOLLARO, A. DE LIETO. (*Annali di Ottalmologia*, XXXII, No. 7-8, p. 478, 1903.) Lieto Vollaro communicated the results of his research on this subject and exhibited the histologic specimens connected therewith at the meeting of the Ophthalmologische Gesellschaft at Heidelberg in 1902. He found that the opacity which constitutes the arcus senilis owes its origin to a more or less abundant infiltration of fatty granules, both in the stroma of connective tissue and in the interstitial spaces and the lacunæ in the periphery of the cornea. At the same time, he states, the fat thus found in the cornea affected with gerontoxon has a different histo-chemical composition from the fat found in organs affected with fatty degeneration. It does not respond with the characteristic reaction of the latter to the osmic acid test, and it may be assumed that it partakes rather of the nature of stearin or palmitin or possibly oleic acid. In a certain number of cases the coincident occurrence of hyaline concretions was noted in the arcus senilis, as Fuchs has described. This may be regarded merely as an accessory fact, as even in these cases the infiltration of fatty granules is distinctly conspicuous.

Ichthyol in Various Forms of Keratitis

SALVO, V. (*Annali di Ottalmologia*, XXXXII, No. 7-8, p. 519, 1903.) Salvo reviews his clinical experience with ichthyol, remarking that this drug has found application in every line of surgical work, and ophthalmology is no

exception. The literature on the subject, however, is rather contradictory. The effect of ichthyol is due to its two principal properties: it is an antiseptic and, as such, has found wide and undisputed application in all infectious conditions of the conjunctiva; it is also a vasoconstrictor, and it is in regard to this property that writers are still disputing over its therapeutic indications. All agree that the reactive development of the vessels which takes place in keratitis and in all solutions of continuity in the corneal epithelium participating in the ulcerative process of Bowman's membrane constitutes an effort on the part of nature toward repair. On this account some maintain that ichthyol, by its vasoconstricting action, may interfere with this natural curative process.

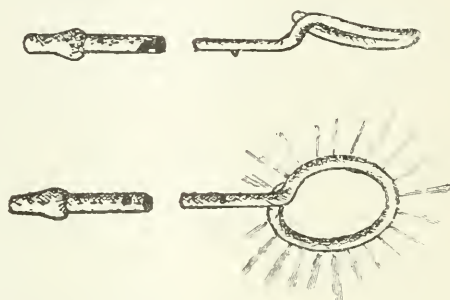
Corneal ulcers following, for example, trachoma, are produced by two principal causes; by the infectious secretion from the conjunctiva which remains abnormally long in contact with the corneal epithelium; and by the traumatic action exerted on the same epithelium by the trachomatous nodules. When the ulcerative process has developed we chiefly rely upon atropin which although it cures the complication, is powerless against its original cause. On the other hand, the most of therapeutic measures that combat the various forms of conjunctivitis injure and disturb the normal ulcerative process. With all our care there always remains a certain amount of conjunctival irritation which increases the catarrhal or purulent secretion. This, not being disinfected sufficiently by the tears or not being removed, owing to the blepharospasm or photophobia, by winking lies on the cornea, favors infiltration of the epithelium and increase of corneal opacity. This is the precise reason why ichthyol is the remedy *par excellence* in these cases. By its antiseptic properties it combats the cause producing the ulcer, and by the absence of irritation of the conjunctiva, neither stimulates secretion nor hinders repair of the ulcer. At the same time, its vasoconstricting action, far from interfering with the process of repair, promotes it, as this action is so slow and gradually exerted that it arouses and favors the circulation in the new-formed smaller vessels, thus abbreviating the natural reparative processes. For these reasons he urgently commends the use of ichthyol prepared with

equal parts of glycerine and distilled water, especially in ulcerative keratitis of the so-called strumous variety with phlyctenulæ and diffuse infiltration of the cornea. It is applied with a brush, once a day to the everted lids.

Copious Lavage by Means of a Specil Eye Irrigator in the Treatment of Ophthalmia Neonatorum.

GALIANO, A. (*Annali di Ottalmologia*, XXXII, No. 7-8, p. 522, 1903.) The little instrument, devised by Galiano and shown in the cuts, the author believes, fully answers the purpose for which it was intended, namely, to render the cure of ophthalmia neonatorum easier and more certain. As is well known from 30 to 40 per cent. of the inmates of asylums for the blind owe their loss of sight to this affection at their entrance upon life. In Europe the number of victims of gonorrheal conjunctivitis amounts annually to 30,000. The report on blindness and the blind in France by Professors Trousseau and Truc, and the quite recent statistics in regard to the cause of blindness collected by Professor Golesceano from 2000 patients at the *Hospital des Quinze-Vingt* at Paris, demonstrates that these statements are not exaggerated. In seeking the causes for this enormous amount of blindness, he believes that the gravity of the affection is not more responsible than the neglect of adequate means of prevention and the lack of care in treating it. All forms of treatment and prevention have their advocates from Credé's method of prophylaxis to the classic treatment first proposed by Graefe, that is, cauterization of the conjunctiva with the modified stick or a 2 per cent. solution of silver nitrate. Among these are antiseptic lavages with sublimate, cyanid of mercury, iodin trichlorid, potassium permanganate, chlorine-water, etc. Itrol, protargol, ichthargan (so vaunted by Darier), picric acid proposed by Professor Angelucci, or finally, simple irrigation with physiologic salt solution which has given such good results in the hands of Kalt of Paris, von Ammon of Monaco and Lamhofer of Leipsic. The necessity for irrigating the eyes is established beyond question, but in the first stage of the affection, when the lids are much swollen and secretion is constantly recurring, how is it possible to wash out the conjunctiva accurately and continuously? And if it be possible to accomplish the irriga-

tion by means of Holt, Morier or Gradenigo irrigator, it is rarely possible to provide the expert to repeat the irrigation every fifteen to twenty minutes, a repetition that Galiano considers necessary to avoid infection of the cornea, particularly during the first stage when the secretion is most virulent. The irrigator he has invented to overcome these difficulties is very simple, merely a small oval silver tube, resembling in its curved outline the edges of an artificial eye. It is perforated around the periphery and a rubber tube and bulb with a capacity of about 200 gm. of water is readily attached to it. The small oval tube is easily inserted under the lids and can remain there the entire day. The mother of the baby or its attendant, every



fifteen to twenty minutes, fills the bulb with a tepid physiologic salt solution, fits the rubber tube (which is provided with a bayonet catch) on the oval tube, and forces by pressure on the bulb the fluid into the conjunctival cul-de-sac. The irrigating fluid emerges at the point where the lid is slightly raised by the entering tube.

Every two hours a weak solution of carbolic acid is substituted for the salt solution. In the evening the silver tube is removed and sterilized by boiling. The presence of the tube does not interfere with the application of compresses intended to allay the inflammation. After two or three days of this treatment the lids are no longer swollen; the secretion has materially diminished and the infant commences to open its eyes. The instrument is then discarded and two drops of 2 per cent. solution of silver nitrate are instilled morning and evening. If the cornea is

already damaged before the case is seen. Galiano leaves the apparatus in place until the secretion has almost entirely disappeared. After this he cauterizes the conjunctiva with the modified stick or silver nitrate. The small tube does not cause any irritation of the globe as the swollen condition of the lids keeps them closed and immovable and thus prevents any slipping around of the tube. The advantage of such continuous lavage and disinfection of the cornea as well as the entire conjunctiva are obvious and invaluable, Galiano also recommends this form of irrigation in diplococcus conjunctivitis with lesions of the cornea.

The Color Sense and Color Blindness in Children:

ROSELLI, R. (*Annali di Ottalmologia*, XXXII, No. 7-8, p. 528, 1903.) Roselli found, in examining the color sense of 100 children, that the younger the child—provided it can express its sensations—the more readily is color-blindness detected. Recognition of colors in children is, of course, in direct proportion to the development of their intelligence; the more intelligent the child the more readily recognized. The color sense develops earlier and more perfectly in girls than in boys. The former distinguish colors much better than boys and cases of color-blindness are less frequent among them. It was found that of the 100 cases examined the boys distinguished red better than any other color, and in many instances they recognized this color when they were unable to distinguish any other. After red, purple was the most easily distinguished. Many of the boys could distinguish red, purple or violet, but not green. All the children in whom color-blindness was noted at first, became in time able to recognize and distinguish colors after appropriate exercises. He concludes, therefore, that true color-blindness does not exist in children, but merely a lack of color recognition owing to lack of exercise from ignorance of the color sense. This is also Favre's opinion. Roselli concludes that color blindness in adults, when it is not acquired, is due solely to absolute lack of exercise in discriminating between colors, which entails in time (non-congenital) atrophy of the various nerve fibrils for the primary colors and hence an optic impotence for colors.

Extreme Exophthalmus Due to a Bony Growth in the Orbit.

ROSELLI, R. (*Annali di Ottalmologia*, XXXII, No. 7-8, p. 538, 1903.) Roselli describes the case in question as remarkable because of the preservation of some vision with normal excursions of the eyeball, monocular and associated, in the presence of an extreme exophthalmus. The patient was a man of 35 who had contracted syphilis 6 years previously, but, after the first manifestations and specific treatment had never exhibited symptoms since. He reports that two years ago while he was carrying a heavy box on his shoulder he turned to look back and upward and felt a kind of "cracking" sensation in the depths of the right orbit. At the same time the exophthalmus occurred suddenly in the right eye. The exophthalmus gradually increased and he applied to an ophthalmologist who prescribed a simple collyrium. Then he consulted Roselli who applied a compress bandage and gave him a course of antisyphilitic treatment, but without improvement. The lids Roselli found normal although the patient was unable to close them. The protrusion was 11 mm. beyond the sound eye. The vessels in the conjunctiva were hyperemic; the cornea, iris and refracting media were normal. The fundus was slightly anemic, especially the papilla. The intraocular pressure seemed abnormally increased. Exploratory puncture behind the eyeball was negative. The movements were free but vision was reduced to 1/10. The visual field was restricted, especially on the nasal side. Lacrimation and photophobia were noted in the sound eye.

As the condition was so serious that the subject was unable to work and the disease seemed to be progressing, operative interference was advised and accepted. The lower conjunctival sac was incised and the eyeball pushed upward, disclosing a cord-like protrusion of the lower bone wall of the orbit, which partially filled the orbital cavity and undoubtedly caused the exophthalmus. Convinced that it would be impossible to remove the exostosis, the eyeball was enucleated and the conjunctiva sutured. After the eyeball had been removed the bony growth could be inspected more closely. It was an ivory-white exostosis shaped like a long narrow cylinder, arising about 2 mm. from the

lower margin of the orbit and extending across it, below the central part of the lower wall, to the optic foramen. After an uneventful convalescence an artificial eye was inserted and the patient returned to his occupation on the twentieth day all sympathetic manifestations in the other eye having subsided.

A Case of Acute Iodism Producing Anterior Polar Cataract.

CORDA, G. (*Annali di Ottalmologia*, XXXXII, No. 5, 6, p. 277, 1903.) Corda reports from the Ophthalmologic Clinic at Pisa, a case of bilateral cataract induced by administration of potassium iodid. He has been unable to find a similar case in literature, although cataract has frequently been experimentally produced by the administration or injection of the sodium and potassium salts and other substances that dehydrate the tissues, such as glucose, saccharose, lactose and naphthalin. The experiments were made on the crystalline lens of the frog, rabbit, cat, rat, dog and ox, administering the drug by the mouth, by subcutaneous injection and by instillation into the conjunctival sac.

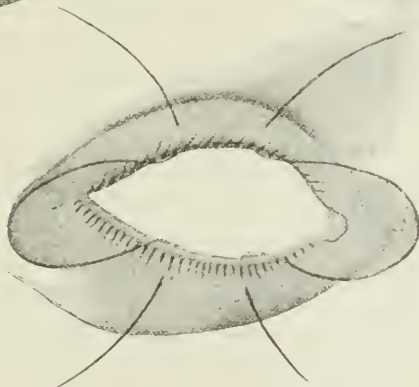
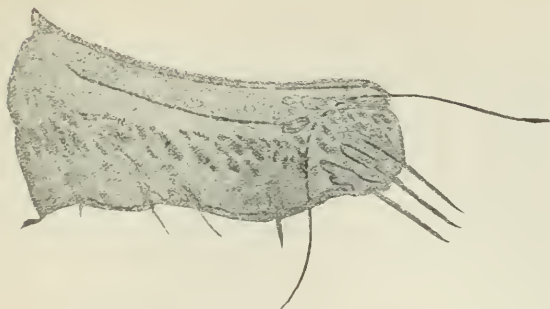
Heubel attributes the formation of the cataract exclusively to the affinity of the drugs for the water in the organism, while they have little affinity for the other constituents of the body, especially the albuminoid substances. This view is sustained by the fact that the opacity rapidly disappears when the frog or the isolated lens is immersed in water. It is remarkable that troubles of this kind have not been observed clinically. Not a single instance has hitherto been reported of its occurrence in man. In the present case a healthy and robust man to relieve a tendency to obesity, took 30 drops daily of a solution of potassium iodid in distilled water, 30 gm. of each. He commenced with 5 drops and increased by 5. The third day he noticed muscular pains in the sole of the foot, extending to the leg on the fourth day, and by the seventh he came to the Clinic with lacrimation, photophobia and blepharospasm. He had taken in all 1.5 gm. of the iodid. Medication was suspended the next day; examination disclosed myosis and a slight opacity in both eyes, resembling a semi-transparent disc in the center of the capsule of the lens, with an irregular space between

its edge and the margin of the iris. A regular and narrow black zone was also noticeable on the free margin of the iris. It was impossible to determine whether the opacity was or was not extra-capsular, but Corda accepts it as behind the capsule. No treatment was attempted except suspension of the iodid and irrigating the eyes with a solution of boric acid. The patient was able to count fingers at two yards only, but when he returned four days later, vision had improved to 5/7.5 on Wecker's chart, and the fundus of the eye appeared perfectly normal. Vision improved to 5/5 at the end of the month.

The Advantages of the Post-Operative "Open" Treatment,
Especially in Extraction, the "Bird's Foot" Suture for
Occlusion of the Lids.

TORNATOLA, S. (*Annali di Ottalmologia*, XXXII, No. 5-6, p. 284, 1903.) Since Odhelius of Sweden in 1772 advised that dressings be applied to eyes that had been operated on, the subject has been frequently discussed at congresses and elsewhere. The partisans of this "open" treatment claim that it prevents accumulation and stagnation of the secretions within the sac, that the eye is cooler without bandages and that it can be cleansed without difficulty several times a day. The patient is also relieved of the depression induced by wearing a bandage and there is no dragging on the lids from the weight of the dressings.

Tornatola has never joined in this chorus, as in the first place he deems it unnecessary to cleanse the eyes several times a day, and thinks the increased temperature under the bandage to be of little moment and harmless, while there is no dragging on the lids by a light dressing well applied. On the other hand, the slight pressure of the dressing keeps the lips of the wound in contact even during sneezing and coughing and protects the eye from the involuntary touch of the hands and from infectious influences. The statistics offered by the partisans of "open" treatment are still too scanty for a final judgment. The only occasion, in his opinion, for suppressing the bandage is when the patient refuses to tolerate it, but these cases are rare. In such instances, and especially after cataract extraction, he prefers to suture the lids together, using for the purpose the "bird's foot" suture which he



described in a communication last year on sympathectomy. This method of suturing has the advantages that it can be tied and untied at will; the eye is further protected against infection when a thin layer of cotton is applied outside, moistened with some sterile solution and renewed two or three times a day.

It is also desirable for all cases in which the surroundings are not scrupulously aseptic, and the subjects are not intelligent and docile. In the latter case he prefers a dressing.

Suturing of the lids will be found useful after various operations on the cornea as well as after extraction of cataract. Two needles carrying strong silk sutures are passed through both lids (as shown in Flgs 1 and 2,) avoiding the openings of the Meibomian glands. Each thread passes for a distance of 2 mm. along the posterior surface of the tarsus and emerges about 3 mm. from the margin of the lid at the junction of the outer with the middle third. The loops made by the threads are then pulled out long so as not to interfere with the operation that follows. After this act is completed, the ends of each thread are passed through two or three beads, the margins of the lids are approximated with the fingers, and each thread is tied in a bow-knot. These can be united at will every day if necessary, or several times a day. Such a method of closing the eyelids after operations has proved a great improvement in the writer's experience, over Michel's plan of dressing the eye, or Arlt's method of occlusion, or simple wire suturing. It has proved extremely useful in cases of acute or chronic exophthalmus with insufficiency of lid closure and in simple corneal ulcer complicating paralytic lagophthalmus, ectropion, etc.

OPHTHALMIC NEWS, ITEMS AND ANNOUNCEMENTS.

(Under this heading the ANNALS will publish items of interest. Please address Dr. B. E. Freyer, 520 E. Ninth Street, Kansas, City, Mo.)

Dr. Eugene H. Oppenheimer, of Berlin, has been added to the editorial staff of the ANNALS.

Dr. G. E. de Schweinitz has moved his residence and offices to 1705 Walnut street.

Dr. A. B. Hale, of Chicago, is now a member of the editorial staff of the Ophthalmic Record.

Newark, N. J.: According to the will of Eugene Vanderpool, the Newark Charitable Eye and Ear Infirmary will receive \$10,000.

Dr. George A. Fleming has been appointed professor of Ophthalmology and Otology at the Women's Medical College of Baltimore.

The ANNALS' has made arrangements with Dr. Frank L. Henderson, 310 Century Building, St. Louis, to assist the editorial department.

Dr. John C. Campbell, of Toronto, has received the appointment of House Surgeon at the Royal London Ophthalmic Hospital.

Dr. G. Maitland Ramsay of Glasgow, Scotland, will attend the meeting as invited guest of the Ophthalmic Section of the American Medical Association at the next session.

Dr. Wm. Zentmayer, 1423 Walnut St., Philadelphia, will collaborate in preparation of the abstracts from German Ophthalmic Literature on the ANNALS.

Mr. Claud Worth, 138 Harley St. W. London, England, has joined the staff of the ANNALS and beginning with the January issue of 1904, will have charge of a special English edition.

Dr. George M. Gould in *American Medicine* (July 4, 1903) gives 68 tabulated reasons why glasses "did not give relief," the reading of which will help many an ophthalmologist in his work.

The chapter in *Ophthalmology in Pregressive Medicine*, for 1903, is written by Dr. Edward Jackson, and it presents a full resumé and review of all the important ophthalmic literature of the past year.

The third edition of May's admirable work "Diseases of the Eye" has been published. While several additions have been made the book has not been much increased in bulk. (See review in this number.)

Dr. George C. Savage has been made secretary of the faculty of the medical department of Vanderbilt University, Nashville, Tenn., and Dr. Geo H. Price, professor of diseases of the eye, ear, nose and throat.

The next annual meeting of the Academy of Ophthalmology and Otolaryngology (formerly the Western Ophthalmologic and Otolaryngologic Association) will occur in Denver, Colo., August 24, 25 and 26, 1904.—*Amer. Med.*

Dr. E. A. Spilsbury has been appointed surgeon to the Eye, Ear, Nose and Throat Department of St. Joseph's Hospital, Yonkers, N. Y., and also assistant at the Manhattan Eye and Ear Hospital, New York.

A Spanish-American Ophthalmological Society is to be founded. The meetings will be held annually in Madrid or elsewhere if so elected. The permanent secretary is Dr. Sanz Blanco, Espoz y Mina, 13. Madrid.

Gift to the N. Y. Eye and Ear Infirmary.—The building of this institution was given by the late William C. Schermerhorn. His three daughters have lately presented \$15,000 for the purpose of purchasing instruments, furniture, bedding, and other necessary equipment.—*New York Med. Journal.*

Test for Color-Blindness.—Fridenberg asserts that the

Holmgren test is not adequate for practical purposes. It should be supplemented by a lantern test. He has devised a lantern which is intended to reproduce service conditions on a diminished scale.—N. Y. and Phila. Med. Journal.

To Test Eyes.—Henry Phipps, Jr., has sent \$350 to the First Ward Manual Training School, Allegheny, with a suggestion that the money be used in the examination of the eyes of the school children. He will add to his contribution a sufficient amount to secure treatment and the procuring of glasses for those who are found to need them.—Journal Am. Med. Association.

Post-mortem Pupillary Changes.—Placzek says that the pupils of men and animals change after death in a certain definite manner which he calls "pupillary rigidity" (*Pupillenstarre*). The action of myotics and mydriatics—with the exception of suprarenal extract—is without effect upon the pupil after death, no matter how strongly it may act during life. Suprarenal extract acts after death as a mydriatic, it delays the rigidity of the pupil decidedly and inhibits its intensity. The post-mortem rigidity of the pupil is purely a muscular process.—N. Y. and Phila. Med. Journal,

Scientific Devotion of Roux and Metchnikoff.—Roux and Metchnikoff have succeeded, they believe, in inoculating a chimpanzee with syphilis. It is accepted as such by Fournier, although he remarks that the appearance of secondary symptoms would be still more conclusive. The researches are to be continued, and as the Institute Pasteur, with which these scientists are connected, is not rich enough to supply the necessary material in the line of chimpanzees and other monkeys required for the purpose, Roux and Metchnikoff propose to devote to it the prizes recently bestowed on them. As our readers will remember, Roux received the Osiris \$20,000 prize and Metchnikoff a \$1,000 prize from the Institute.—Journal Am. Med Association.

Supplementary Lantern Test for Color Perception.—C. H. Williams finds some cases able to pass the Holmgren test who, when examined with lights from a distant signal, are unable to

distinguish red and green. This occurs generally in acquired defects caused by tobacco and alcohol. The defect is central, and sometimes so small that the large skein of worsted is partly seen in the immediate periphery. A distant signal light would have its image formed wholly within, the affected area. The author has devised a new lantern having on its face a disc with 18 colored glasses and within, two lights and a shutter. It is found that with two lights at one time a person is often more confused than with one. With a light and dark red he will often call one green. The shutter cuts off one light or changes the area. A record is kept by means of numbers accompanying each colored glass. The candle power can be raised or lowered by a rheostat. With the two tests no dangerously defective case will be overlooked. With either alone it is possible that this should occur. (H. M.)—*Am. Med. Jour.*

Subtropical Trachoma, and a New Remedy in its Treatment.—Ruffin A. Wright describes under this title a rather mild type of the disease, and one which the negro almost wholly escapes. The author advocates the use of a five per cent. ointment of copper citrate, although believing that a ten per cent. ointment will be readily tolerated as soon as excessive secretion has been allayed by one of the silver salts. This treatment appears to have originated with F. R. von Arlt, but it has not been used before in America. Emphasis is laid upon the fact that it does not cure trachoma more quickly than other non-operative methods, but possesses the very great advantage of causing so little pain that the patients readily submit to daily home treatment for a long period. Another claim made for it is that it produces absorption and disappearance of granulations and hypertrophied papillae quite as rapidly as other applications. The majority of patients will tolerate the application twice a day. A good plan is to apply the remedy at night, letting it remain in the eyes during the night. Its use is contraindicated when there are corneal ulcers or iodine preparations are being used either externally or internally.—*Jour. Am. Med. Ass'n.*

A New Journal of Syphilography.—Dr. T. Barthelemy, physician to St.-Lazare in Paris and formerly chief of clinic at the Hospital St. Louis, has begun the publication of a month

ly, Journal, *La Syphilis*, which will be devoted exclusively to the study of the disease designated by its title. The first number, dated July, 1903, contains an article on "Syphilis of the Stomach," by Prof. Alfred Fournier, an analytical review by Dr. Levy-Bing of two articles on the same subject by Prof. Dieulafoy, and an article entitled "General Program of Syphilography" by the editor. There are also reports of clinics by Drs. Gaucher and Brocq, and an account by Dr. Barthelemy of an untreated case of lues. Following these are the usual abstracts from other Journals, Society reports correspondence, therapeutic notes, and bibliography.—N. Y. Med. Record.

A Committee composed of Axenfeld of Freiburg, Germany, Sulzer of Paris, France and Würdemann of Milwaukee, U. S. A., will report to the next International Ophthalmologic Congress, Sept., 1904, to be held in Luzern, Switzerland, upon the "Prevention of Accidents to the Eyes Occuring in Trades and upon the Estimation of the Damage to the Earning Ability after Loss of Vision from Accidents."

The Size of the Pupil as an Aid to Diagnosis.—Dr J. T. Duncan gave this classification:

a. Patient may have pupils evenly contracted. This may indicate: (1) locomotor ataxia, (2) meningitis and enccephalitis (early stages), (3) chronic inflammation, cervical cord, (4) apoplexy of pons, (5) epileptic fits (early), (6) uremia, (7) tobacco amblyopia, (8) retinitis, (9) opium poisoning, (10) use of myotics.

b. Pupils may be evenly dilated: (1) paralysis of both third nerves (post-diphtheritic), (2) intracranial tumors (late), (3) intracranial effusions, (4) irritation cervical sympathetic, (5) acute inflammation, cervical cord, (6) premonitory of locomotor ataxia, (7) after epileptic fits, (8) cataracts, (9) amaurosis, (10) acute mania or melancholia, (11) mydriatics,

c. Pupils may be unequal, then we suspect: (1) locomotor ataxia, (2) general paralysis of insane, (3) unilateral lesion of third or sympathetic nerve, (4) pain in branch of fifth nerve, (5) old iritis, (6) carotid aneurism or tumor of neck, (7) use of a myotic or mydriatic in one eye, (8) unilateral cranial lesion, (9) acute glaucoma (unilateral).

I. The pupils are contracted and fixed: In list A we exclude uremia, meningitis and encephalitis, retinitis, tobacco amblyopia. The remaining conditions can be differentially diagnosed.

II. Pupils are evenly dilated and fixed: Rare. Present in (1) amaurosis, (2) use of mydriatics, (3) complete paralysis of both third nerves.

III. Pupils are uneven but fixed: This usually points to locomotor ataxia or general paralysis of insane.—Proceedings of Canadian Med. Association, Journ. A. M. A.

Oculomotor Palsy.—In a remarkable case reported by Frankl-Hechwart (Obersteiner's Arbeiten, Vol. ix. p. 323), paralysis of the right oculomotor nerve in its distribution to the external ocular muscles occurred rapidly without any cause that could be determined. The inner muscles of the eye were not affected. The lesion was found to be a neuritis, and the nucleus of the nerve was almost intact. This finding is important, because a partial paralysis has been thought by some to indicate an alteration of the nucleus of the nerve—a view which seems to be incorrect. The microscopic examination of the nerve also revealed no detectable cause for this neuritis.

Total unilateral oculomotor paralysis from aneurism of the internal carotid as in E. Lindner's case (Wiener klin. Wochenschrift, 1902, p. 1193.) is of rare occurrence. The patient, a woman, aged forty-two, had suffered from unilateral or more general headache occasionally. The oculomotor palsy developed after an attack of headache with vomiting, so that the symptom-complex was much like that of the recurrent oculomotor palsy. Although in most cases the headache ceases when the paralysis appears, in Lindner's case it persisted. The nerve palsy was of the same intensity from the beginning, and implicated all branches of the oculomotorius. It seemed that the lesion was at the base of the brain. In all cases of recurrent oculomotor palsy with necropsy yet reported basal lesions have been found. In Fiedler's case of aneurism of the carotid the palsy increased in successive attacks until it became complete and in this respect the two cases differed.

Lindner discusses the symptoms of cerebral aneurisms. The symptoms may develop suddenly and may vary in in-

tensity from time to time, or may be persistent and unaltered, or the aneurism may be latent until rupture occurs. Other cranial nerves may be implicated. In some cases the optic nerves are normal; in others optic neuritis is found. Subjective noises in the head are sometimes most annoying and may be constant or occur at intervals, and especially when the patient is lying down, so that he is obliged to sit up at night. These noises may sometimes be heard by the examiner, and may be lessened by compression of the carotid. Headache is a frequent symptom, and vertigo and vomiting also may be complained of. A cerebral aneurism is known to have existed for eleven years, but it may be present only a few days.—*Progressive Medicine*, Sept., 1903.

The Cause of Hay Fever.—Professor Dunbar, of Hamburg, claims that he has been able to isolate the toxic substance, which in predisposed individuals is capable of producing hay fever. The results of his experiments are given in the July *Edinburgh Medical Journal*. By injecting the isolated toxin into animals, he has been enabled to obtain from them a serum which antagonizes the poison: (1) With rye pollen he touched the nostrils of six persons, three liable to hay fever, and three immune. In the former marked nasal symptoms followed, while the latter were perfectly unaffected. (2) The pollen was applied to the eyes of the same persons, and in those who suffered from hay fever, lacrimation, edema of the lips and even chemosis followed. The three persons who were not subject to the hay fever escaped all symptoms. (3) He placed two persons—one hay fever patient and one immune—in a glass room, and made each blow into a small vessel containing rye pollen. The hay fever subject was attacked by all the characteristic symptoms of the complaint in a somewhat aggravated form. The other person suffered no discomfort. (4) He applied pollen to the arms of a hay fever patient and itching, lasting for hours, was produced. He did the same to an immune person and no effect resulted.

Professor Dunbar made several investigations into the composition of pollen, under what conditions it was active and when inert, and concluded that hay fever poison is a soluble toxin. He also decided that the starch bodies of the pollen contain the toxin, and he further found that only the starch bodies of the graminaceae are active in this way. He

injected pollen toxin hypodermically into a medical man who suffered from hay fever. The patient suffered in fifteen minutes from all the symptoms of hay fever, which for the space of four hours became worse. The injection was made in the forearm, and in twenty minutes it began to swell, and in the evening the intumescence extended from elbow to hand. This took some days to pass off. Another doctor—immune from hay fever—suffered no inconvenience save a slight swelling at the seat of injection. Finally he injected rabbits with toxin, and after several weeks obtained a serum which he found could neutralize the toxin. He also thought it probable that rye antitoxin would neutralize the toxin of other grasses.

The outcome of the experiments made by Professor Dunbar have, to a great extent, been confirmed by Sir Felix Semon and Dr. McBride in Great Britain. With regard to the clinical uses of the antitoxin, however, the matter is still *sub judice*. Nevertheless it is a great advance to have isolated the toxin of this extremely troublesome affection, and there would seem reason for the belief of Professor Dunbar that he has discovered an antitoxin for one form at least of hay fever. It is not improbable, however, even if the pollen theory is correct, that there are pollens and pollens and hay fevers and hay fevers, and that the special pollen which causes an attack of the disease in one person will not affect another who may yet be susceptible to the pollen of some other plant. If that is the case, it will be necessary to manufacture as many antitoxins as there are varieties of hay fever inciting pollens, and then to decide upon the special form of hay fever from which the patient is suffering before selecting the appropriate antitoxin.—Med. Record.

Optic Neuritis in Diphtheria.—Optic neuritis occurring in diphtheria, according to Charles Belton (Lancet, December 13, 1902, p. 1624), has not been reported except in the two cases published by him. In the first case no albumen was found in the urine, and, therefore, nephritis could be excluded as a cause. The neuritis appeared and disappeared under observation while the child was suffering from diphtheritic paralysis. It was less intense in the eye in which the greater degree of hypermetropia existed, and could not have been mistaken, therefore, for the condition simulating it, which may be seen in hypermetropia. In both cases the neuritis

was not very great, and the duration was about two months. In the first case the neuritis appeared during the fourth week of the disease, and in the second probably about the third or fourth week.—*Progressive Medicine*, Sept., 1903.

Proceedings of British Medical Association. — Ocular Changes in Relation to Renal Diseases.—Mr. Edward Nettleship contributed a paper on this subject. Although much already is known about the eye changes in renal disease, he said information is still needed, both from ophthalmologists and physicians, on several points, and he suggested the following heads as furnishing matter suitable for discussion.

1. Does albuminuric retinitis ever occur in acute nephritis other than the kidney affection of pregnancy?

2. Cases of retinitis from lardaceous disease of the kidneys and from nephritis due to inflammation of the bladder, ureter, or pelvis of the kidney should be reported.

3. The retinitis of pregnancy. Cases of this are desired: (a) In which it is known that the kidneys were diseased before the first pregnancy; (b) in which there is positive evidence that they were sound. It seems that most of the cases of pregnancy retinitis occur between the ages of 30 and 40, after several pregnancies and several attacks of pregnancy dropsy, and that the prognosis for life is better than in ordinary renal retinitis. These facts harmonize with the other evidences that the kidney disease induced by pregnancy is a peculiar and often recoverable affection. All cases of pregnancy retinitis should be examined for signs of established chronic nephritis. The propriety of inducing premature labor may depend partly on the diagnosis in this respect.

4. Age and sex. If all cases of renal retinitis (except those due to pregnancy) are counted together without reference to age the males are found to be nearly twice as numerous as the females, the proportions being about the same as for chronic nephritis. But when the retinitis occurs early in life the sex proportions seem, from the scanty material available for comparison, to be almost reversed. All cases of renal retinitis in young subjects should be recorded.

5. Recognizing two chief factors in the production of renal retinitis—the state of the blood and the state of the retinal

blood vessels—all cases are asked for in which a condition of visible disease in the retinal arteries without evidence of kidney disease has been followed sooner or later by unequivocal signs of chronic nephritis.

6. Do the characters of the retinitis in different cases, as has been recently asserted, justify any inference as to the kind of nephritis (chronic interstitial or chronic parenchymatous) from which the patient is suffering? Attention is here called to the importance of watching the course of the retinal disease from the beginning to end, and of distinguishing between the two kinds of white opacities; the soft-edged, white, or grayish white patches in the nerve-fiber layer, and the brilliant, intensely white, sharply-defined patches composed of confluent dots situated in the deeper layers and often arranged in the familiar radiating pattern around the yellow spot.

7. When retinitis occurs in both glycosuria and albuminuria, to which of these is it due? Retinitis in diabetic persons whether their urine contains albumen or not, occurs later in life than albuminuric retinitis, but the relative liability of the sexes is about the same as in the ordinary albuminuric retinitis (excluding pregnancy cases).

8. Other points needing elucidation: The influence (a) of scarlet fever and (b) inherited syphilis in producing the chronic renal disease leading to retinitis; (c) the occurrence of renal retinitis in only one eye; (d) cases in which more than one attack of retinitis has been seen and watched through, with special reference to the changes left by the first attack, and to the effect of retinal atrophy on the characters of a second attack; (e) when pigment spots are left by renal retinitis, why are they so often found at the periphery of the fundus? (f) the cause of the night blindness occasionally met with in renal retinitis; (g) the nature and ophthalmoscopic appearances of the chorioiditis said to occur in some cases of albuminuria; (h) the nature of the white, opaque thickening of the coats of arteries and veins seen after some cases, and of the appearances resembling retinitis pigmentosa after others.—*Journal Am. Med. Association.*

Definition of Ophthalmology.—In this, as in most other matters, the "Century Dictionary" is correct. An optician who has not studied medicine and does not claim ability to

treat diseased conditions, cannot rightly describe himself as an ophthalmologist. To our mind the best short definition of *Ophthalmology* is that given by Dr. Gould in his "Medical Dictionary," viz., "the science of the anatomy, physiology and diseases of the eye," which corresponds exactly with the "Century Dictionary's" definition. There have been prosecutions of opticians for using the title "Dr.," but we have not heard of any for using the word "ophthalmologist." We believe, however, if such a case were instituted that the Court would have no alternative but to enjoin the use of the title if the defendant in the case were not a qualified physician. It seems to us inadvisable for the optician to use any title which would imply an invasion of the medical field as far as disease is concerned.—The Keystone.

Radium and Blindness.—Dr. Almon Jenkins and Mr. W. J. Hammer, an electrical engineer, are engaged in some interesting experiments with radium on a blind girl. That the optic nerve of this child is practically dead would seem to be shown by the fact that it is stated that the child saw nothing when magnesium ribbon was burned before her eyes, yet it is claimed that under the conjoined action of the *x*-ray and radium the child declared that she saw light. While there is no likelihood that these experiments have any practical bearing, they are of interest in connection with a study of the marvelous properties of the new substance radium.—Journ. A. M. A.

Optical Fakirs at Expositions.—It is not too early to impress on the management of the St. Louis Exposition the duty which they owe to the public in the matter of granting the optical concessions at the big fair. At a number of recent expositions the spectacle-selling privileges were secured by moneyed folks, who took advantage of the opportunity to impose in an audaciously fraudulent manner on guileless and confiding visitors. We have, with our own eyes, seen the most dishonest trickery resorted to by these folks to sell spectacles, and no doubt numberless people suffered from the imposition. The visitor who pays to see an exposition is entitled to protection from sharpers. He does not pay his good cash for the privilege of being fleeced, nor should any one be granted the privilege of fleecing him. These fly-by-night no-

mads, who pose as privileged eye specialists, are parasites on the profession proper, and it is a crime against the public no less than the optical profession that their operation should be covered by the sanction of the management of any fair or exposition. In an editorial on the subject some time ago the Philadelphia Medical Journal said:

The scamps, who travel from fair to fair and from town to town, deceiving and hoodwinking people, and who have neither optical knowledge nor a trace of civilized morality, are a fourfold curse—to the great body of legitimate and honorable opticians of the land, to the states and public gatherings which they infest, to the medical profession and the public. The ignorant people, especially when they find these fellows plying their trade under cover of an institution of character, suppose they have the guarantee of the managers and thus the trustful are bamboozled out of their money.

The management of the St. Louis exposition should see to it that concessions of this kind are granted to reputable people and a thorough investigation should precede any such grant.—The Keystone.

Correspondence in regard to the Commission Evil.—THE REQUEST.

Dr. H. V. Würdemann, Milwaukee, Wis. Dear Doctor:—Have a male patient 58 years old coming to my office with inversion of both eyes, the disease has become very chronic. (Right eye) the upper lid has five rows of displaced lashes and he has lost all power to open this lid, the left is not as bad, and it seem to me there is shrinking of the conjunctiva from chronic disease. Especially trachoma. The sight is fairly good of both eyes, now what in your opinion, do you think it would cost him, and what per cent. will you give me if I send you all the eye cases from out this way. The reason why I want to know about what it cost these farmers is so I can tell them before hand to get the money ready. Yours Respectfully.

Signed.....

P. S.—Let me hear from you soon.

THE ANSWER. My Dear Doctor.—Your letter of the 19th inst. received. Ou account of the two *business* questions raised in it, and as I have been approached in like manner before, I have taken some time to formulate a proper answer. I intend that this correspondence shall be published

for the benefit of other young physicians who might ignorantly at some time raise the same questions to their personal detriment.

From the description of your case I think that the eye condition is entropion of the lids, resulting from the cicatricial stage of chronic granular conjunctivitis (trachoma). Plastic operations upon the eyelids will probably relieve the entropion.

It would not be fair to either patient or physician to give estimate of the cost of the work without proper examination. As you well know, professional fees are regulated by several factors:—*Kind of services rendered, amount of time consumed and the financial standing of the patient.* Thus there are no fixed fees for services, the only professional and legal requirements being that they be reasonable and such as are customary with physicians of the class to whom the consultant belongs. Customary office consultation fees in this country rang from \$5.00 to \$25.00, depending upon the standing of the consultant as well as the above named factor.

The above would be a sufficient answer to your letter, were it not for your question “*What percent will you give me if I send you all the eye cases from out this way ?*” I take it for granted that you consider this question quite correct and honorable! I beg, however, to answer it courtly and completely:—

The presumable reason why one physician refers a case to to the care of another, is that he is either unable or unwilling to give proper attention to the patient and sends him to the other's care purely for the patient's good and not as a business transaction.

The giving or acceptance of commissions to physicians (or other people), for sending patients to consultants, is an unethical and dishonest act, which has not been tolerated by true physicians from the days of antiquity. It is *dishonest* because the patient is deceived and the collusion is more honorable than that of the commission business between the doctor and the druggist, which has long been frowned upon by both the profession and laity. It is a *cowardly* proceeding if either of the doctors are afraid to let the patient know what he is paying, that which he has an ethical and legal right to know. *The medical profession is not a trade* and division of fees without the knowledge of the patient would

be degrading the whole profession to the trade level.

I am not practicing medicine as a business, but as a profession, and while I am entitled to a fair fee for the knowledge, time and labor expended on the case, cannot stoop to the tradesman's means of hiring drummers to get me patients. Your proposition would degrade you to a "hired man" or "barker" for the *quack* who might accept.

You may have, in some instances, spent time in caring for or in accompanying a patient to the consultant's office and feel delicate about submitting a bill for same; why, that is pure cowardice the laborer is worthy of his hire!

On account of his financial condition your patient may not be able to pay the usual fee of the consultant or surgeon, yet you feel that you are entitled to some payment for such services as above stated. The matter is easily arranged; the patient has but to explain his circumstances and the consultant should be willing to reduce his fees so that the family physician may get some payment; but *all this must be done with the full knowledge and consent of the patient*. I am always willing, when necessary when on account of the financial condition of patient, to reduce my bill enough — even to giving my services gratuitously, to allow them to pay you, but I will not pay part of my fee because you are afraid to demand it of the patient.

In conclusion I am willing to do any special work for you for what is a customary fee among specialists of my standing, for patients able to pay same; for others who can pay but little I am willing to do the work for the proportion of the usual fee they may be able to give me after paying for your services; and in cases unable to pay anything, I will cheerfully do the work without monetary recompense upon your recommendation; but I will not hire any medical "barkers" to drum up trade. My strongest reason aside from the ethics of the case, for refusing your request, is that I value the esteem of the general profession more than business, which I could not retain if I abandoned customs and ethics followed since the days of Galen, yea, even from those of Esculapius. Yours very sincerely, (Signed) H. V. Würdemann, M. D.

The forthcoming International Congress of Ophthalmology at Lucerne promises to be a brilliant and attractive function. It has been fixed in 1904 for the 19th, 20th, and 21st of Sep-

tember, presumably in order to avoid the rush of the tourist season in Switzerland. This 10th Congress is to be presided over by Dr. Deucher, President of the Swiss Confederation. All intending contributors of papers should send their manuscript to Professor Mellinger, of Bâle, before May 1, 1904. Communications must not exceed in length five pages of the usual printed report. The one official discussion will deal with the important practical point of indemnity as regards the value of a lost or injured eye. The subscription, £1, is payable to Professor Mellinger.

* * * *

We note with approbation that the communications received will be "immediately printed . . . and will be sent to each member . . . at least two weeks before the time appointed for the opening of the Congress." Other Congresses please copy.—The Ophthalmoscope.

A first Annual Report has been issued by Dr. James Kerr, the recently-appointed Medical Officer of the School Board for London. It appears that the vision of 20,000 children has been tested, and of these the sight was "good" in 15,338; "fair" in 3,878; and "bad" in 1,527. That is not an altogether disquieting result for a generation like our own—that vexes its soul exceedingly upon its degenerance. The proportion of about 10 per cent. of children having "bad" vision remains fairly constant all through school life. The important observation is made that theoretical correction of visual errors is in many cases unnecessary in children. The youthful ophthalmic surgeon will do well to make a note of that fact. In the case of poor parents the burden of procuring spectacles costing 6s. or 7s. a pair is likely to put a severe strain upon their loyalty to the public educational authority which had indirectly demanded the outlay. The Board gives a card to the friends of each child needing further medical advice. This card warns parents against glasses prescribed by sight-testing opticians, chemists and other unqualified persons. At the same time it contains a prescription for inflammatory 'eyes' consisting of 3 grains of yellow oxide of mercury to the half-ounce of lanolin and vaselin. This last-mentioned step appears to be extremely unwise from various points of view.—The Ophthalmoscope.

BOOK NOTICES.

Squint: Its Causes, Pathology and Treatment.

Worth, Claud, F. R. C. S., Published by John Bale, Sons and Danielson Ltd. London. 229 pp., 8 vo. 1903; price 6s. (\$1.50).

Three of the ANNALS staff independently prepared reviews of Worth's book so the editor has concluded to publish extracts from each, especially as he deems the work most meritorious and perhaps the most important addition to ophtalmic literature during 1903. (H. V. W.)

Abstract of Review by Nelson M. Black.

"Squint" is the result of Worth's observations in 2337 cases of squint and heterophoria. His rational treatment and common-sense deductions from etiologic factors causing the condition have laid foundations for radical changes in the management of strabismus.

In chapter III under convergent squint the author says: "In most of the text-books squint is defined somewhat as follows: Squint consists in deviation of the visual axes of one of the eyes from the correct position of fixation. The authors have mistaken a single symptom for the whole disease. One might as well describe Pott's disease as a deviation of the spine from its normal shape."

"Two essential conditions are present in every case of comitant convergent squint:—

(1) An abnormal convergence of the visual axes.

(2) A defect of the fusion faculty.

Other conditions may be found:—

(3) The vision of the eye which is not being used for fixation is almost invariably suppressed.

(4) There is, in rather rare instances, more or less congenital amblyopia.

(5) There is very often acquired amblyopia in the deviating eye, as the result of neglect or inefficient treatment.

(6) There is usually a refractive error, commonly hypermetropia and hypermetropic astigmatism."

From the two essential conditions mentioned above the author has built his whole line of treatment, which consists of developing the fusion faculty, which with the correction of the other condition found results in parallelism of the visual axes in a very large percentage of cases.

Particular stress is laid upon beginning the treatment of squint at the earliest appearance of the condition as the fusion faculty is fully developed by about the 6th year and development of it after this age is almost hopeless.

Out of 1017 cases of monolateral convergent squint the deviation appeared in 75 per cent., before the end of the 4th year and in less than 7 1/2 per cent., its advent was delayed until after the end of the 6th year.

The fusion faculty is developed, after correction of any refractive errors and during the exercise of an amblyopic eye, by an ingenious instrument devised by the author called the "Amblyoscope"; with which binocular vision can be obtained with an existing divergence of 30° or a convergence of 60°. The author is exceedingly particular as to the measurement of the degree of deviation as by this he can determine if there is any improvement: and has discarded the old perimeter method for one of his own which is accomplished by an instrument called the "deviometer"; this may be used with the youngest children, is accurate and the degree of deviation determined much more quickly than any other method.

Convergent squint is given the greatest amount of consideration in the book. The chapters on binocular vision, etiology of convergent squint, and amblyopia, congenital and acquired, are especially interesting and abound in original ideas.

The author does not take a radical stand against operations, but gives the orthoptic methods a thorough test before proceeding to operative measures. The Worth advancement, described in the book, has given better results than any other in the hands of the reviewer.

The author's style does not savor of the Britticisms which usually stand forth so prominently in the book of our English confreres. It is easy, interesting and instructive reading; the type is large and clear cut and the illustrations ample and good.

The book is unique and without doubt the most original and best production, from an ophthalmologic view, of the year.

Extracts from Review by A. B. Hale.

No book which has appeared within recent years should have a greater influence upon the practice of medicine than Worth's "Squint". It shows his care and analytic skill in thousands of cases, his grasp of the philosophy of symptoms and his undeniable right to assert that he has finally determined the cause of the perversion of a function and—within respectable limits—the restitution of this function to the individual.

The book is not perfect, and Worth is so full of his subject as to allow himself to fall into the habit of using the words "impossible" or "never", or the phrase "of course" in speaking particularly of the fusion faculty which he says may not be developed or restored beyond the the sixth year of life. Dangerous words these in medicine, for if students were always satisfied with the dogmatic "of course," we might to-day be rubbing elbows with Galen. And then but naturally for him perhaps, he much prefers his amblyoscope and does not acknowledge the value of the stereoscope in the domestic exercise of the fusion faculty.

Squint has a two-fold interest for the patient who consults a surgeon, and strange to say, the lesser physiologic symptom has for him a greater value. He is usually concerned with the conspicuous ugliness of his trouble, but to the surgeon the loss of function is the more important result. Worth neglects neither one side nor the other, and in solving the problem gives each its proper consideration. Eyes are useful things, and he who has a pair of them (not just two) is better equipped for his competitive struggle for existence. Worth helps us to start these sufferers as equals in the race, which is a great triumph for the modern practice of medicine.

Extracts from Review by Percy Fridenberg.

The author, whose studies of the fusion sense and the influence of its defects in the development of strabismus are well known, has collected the data of his examinations and the results of his treatment in a volume of great practical interest. The subject of motor anomalies of the external ocular muscles has become so overgrown with excrescences of terminology and theory, that 'the trees hide the woods,' and a volume which treats of these conditions

clearly and simply is by no means to be lightly valued. The author advises full correction of the ametropia as soon as possible, and does not hesitate to prescribe glasses for constant use for little children or even for infants a few months old. In addition, the squinting eye is encouraged in its function by occlusion or by atropinization of the *fixing eye only*, and by the training of the 'fusion sense.' For this purpose the author uses his 'amblyoscope.' While a method which demands so much time and patience may not be generally applicable, there can be little doubt of its essential value, as there is no denying that these cases are but too often put off with the statement that they are too young to wear glasses, and nothing else is done for them. Worth shows that the results of fusion training are in inverse proportion to the age at which it is applied, the earlier the better.

In the chapters on heterophoria we find gratifying decision and clearness. "Heterophoria of sufficient degree to cause trouble is quite uncommon" "Heterophoria is essentially a motor anomaly. Squint, on the other hand, is essentially due to a defect of the fusion faculty. In the presence of this fundamental cause, heterotropia may give rise to a permanent squint. Not otherwise." "Rhythmic exercises with prisms, cylinders, etc., are much employed . . . in cases of heterophoria. I have tried them repeatedly and have never seen the least benefit from them." "Partial tenotomies are very commonly performed. I believe these to be useless, as, until the whole of the tendon proper has been divided, no appreciable effect is produced. But the neat and precise method by which these partial tenotomies are performed is very well worth copying. By this method, the tendon itself may be completely divided, leaving its lateral expansions absolutely intact"—an appreciation which "renders unto Caesar," etc., or, as some would think, "gives the Devil his due" with admirable impartiality.

A Hand-Book of the Diseases of the Eye and Their Treatment.

SWANZY, HENRY M., A. M., M. B., F. R. S. I., Examiner in Ophthalmology to the University of Dublin; Surgeon to the Royal Victoria Eye and Ear Hospital; Surgeon to the National Eye and Ear Infirmary and Ophthalmic Surgeon to the Adelaide Hospital, Dublin; Ex-President to the Ophthalmological Society of the United Kingdom; eighth edi-

tion; 167 illustrations and zephyr card of Holmgren's tests. Published by P. Blakiston's Sons & Co., Philadelphia. Price, \$2.50.

Swanzy's book (eighth edition) has again been published in America. It has been carefully revised—from the English standpoint—which means of course that American ophthalmology, which is by all means the most catholic and collective, is hardly mentioned. The work seems good for us, despite this great drawback. I have looked in vain for mention of, or quotation from Knapp, who has made more cataract operations and written more on the subject than any living English writer. Under the heading of trachoma, I have failed to find any mention of the Knapp expression forceps while Grady, of whom I have never heard, is given the credit for forceps operation in trachoma. Why the woodcut in use 25 years ago, to illustrate Kagenaar's modification of Javal and Schiötz' ophthalmometer, or as it is more properly called "keratometer," should be used in a modern work is to me a medieval mystery. He says that by the keratometer, "it is the corneal astigmatism alone which is determined, and it will be found that in the vast majority of cases this is the only astigmatism present." The advocates of keratometry, of whom I am one, rarely find the corneal astigmatism to correspond with the lenticular astigmatism, but it usually bears a certain relation from which accurate calculations may be made.

Again, in anisometropia, the author states, "it is often impossible to fully correct each eye, because, binocular vision, having never really existed, the patients are unable to tolerate the presence of a clear image on each retina. We must then be content with correction of the least ametropic eye, etc. It is strange that the author has not taken up the work of Javal, Bull, and lately, of Worth on the development of the visual acuity and binocular vision. In the chapter under strabismus I find no mention of Worth's (of London) or Black's (of Milwaukee) work upon the cure of squint without operation. One expects to find the description of insufficiency of the ocular muscles dismissed by only a few pages and scientific nomenclatures of heterophoria not even mentioned. It seems even yet that the athletic British, even the ophthalmic surgeons, pay more attention to the biceps than they do to the ocular muscles.

Under "retinoscopy" main attention is given to the shadow test by the *concave mirror*, and the taking of lenses in and out of the trial case, which have long ago been given up by us for the use of the plane mirror and some convenient lens carrier. He recommends the shadow test with the plane mirror at a distance of 4 meters, whereas Jackson and other modern advocates of the objective methods use skiascopy at one or even under one meter, because the central light area of the retina and its accompanying shadow edge, in many cases, is too small to be seen at a greater distance.

I fail to find any mention of protargol or the last and best substitute of silver—argyrol—in purulent and gonorrheal conjunctivitis, although the former is a German product and has been used for a couple of years. In our review by A. B. Hale of the seventh edition, page 18, January, 1901, it was remarked that Swanzy's methods leaned toward the German school. In speaking of the mitigated stick of silver nitrate he says "no remedy is of greater value in purulent ophthalmia than mitigated lapis," etc. This treatment was fashionable a couple dozen years ago. I find nothing about adrenalin or other extracts of suprarenal capsule, in treatment or to secure bloodless operations. It is possible that these medicaments have been overlooked, as they are American products. In these days of good, inexpensive, black and white illustrations, it is really unfortunate that an author should re-perpetrate ancient and crude woodcuts.

Aside from the above criticisms, and a few others which might be made, the work has much to commend it, as the author has placed a great deal of good meat within its pages, and left out much that might be well omitted within a short work; for instance, elementary optics has been omitted, as the author believes that students of ophthalmology should be first prepared in optics. All the inflammatory diseases of the eye are well described. He treats diseases of the iris, ciliary body and chorioid under the heading "Uveal Tract." There are several distinct essays interpolated within the book, such as the motions of the pupil in health and disease, ocular disease and symptoms liable to accompany disease of the brain and spinal cord, amblyopia, etc. The index is one of the most complete that I have ever seen in an English book. The book is valuable to advanced students, but is a little too complete for undergraduates.

H. V. WÜRDEMANN.

The Refraction and Motility of the Eye, For Students and Practitioners.

Suter, William Norwood, Assistant Surgeon Episcopal Eye, Ear and Throat Hospital, Washington, D. C., 12 mo., 390 pp., 4 plates, 101 illustrations. Published by Lea Bros. & Co., Philadelphia, 1903. Price \$2.00.

I opine that this book is intended by the author to furnish a working companion for students and practitioners of ophthalmology and it is to be recommended as such but the doubt always arises in my mind when I read the majority of "hand books" on medical subjects that there is of this class of books already a sufficiency.

What we need in this particular subject is a new work of reference, embracing all of the knowledge brought up to the times. The author gives us a compendium, and although he specifically states that references are not made to the classical works of Helmholtz, Donders and Landolt yet if the subject is really to be studied we must in specific cases go to the more complete work. I know of no school where such a book is systematically studied although all students and practitioners should, and authors must from time to time, look up specific questions in works of this character, for but few ophthalmic practitioners are sufficiently mathematically gifted or have so massive memories as to carry all the facts or even all the rules of optics and refraction in their head.

In these bookish days the practical man keeps many of his facts in his book case and his memory is largely like the index to his books—he knows there just where he can find what his wishes to learn.

The author lucidly explains the theory of refraction with its several subdivisions, including the optical principles of ophthalmoscopy, skioscopy and keratometry and then takes up the description of the refraction and motility of the normal eye, after which he discusses errors of refraction and disorders of motility. These subjects are dealt with in a manner that is pleasing—and for the beginner in refraction, easy to follow. With the theoretic knowledge gained from this work the student is well prepared to take up the problems of practice and is in a position to appreciate the more extensive works of Donders, Landolt, Helmholtz and Tscherning.

As instancing the fact that the book is well up to date is the mention of Worth's work in correction of strabismus by stereoscopic exercises, excitation of binocular fusion by the amblyoscope and developing the vision of the amblyopic eye in squint. Likewise the work of Savage and Stevens is given due credit, together with the best work of European authors. The book is well printed and the cuts are excellent.

H. V. WÜRDEMANN.

A Thesaurue of Medical Words and Phrases.

BARTON, WILFRED M., M. D., Assistant to Professor of Materia Medica and Therapeutics, and Lecturer on Pharmacy, Georgetown University, Washington, D. C.; and WALTER A. WELLS, M. D., Demonstrator of Laryngology and Rhinology, Georgetown University, Washington, D. C. Handsome octavo of 534 pages. Philadelphia, New York and London: W. B. Saunders & Company. Flexible Leather, \$2.50 net; with thumb index, \$3.00 net.

The preface states that this work originated some years ago in an effort to find a certain technical term which had "temporarily escaped," a condition in which all writers occasionally find themselves. Roget's Thesaurus fills this place most ably for general literature, but the vast number of technical words used by the medical writers has not been included in this great work.

This work is the only Medical Thesaurus ever published. It performs for medical literature the same services which Roget's work has done for literature in general; that is, instead of, as an ordinary dictionary does, supplying the meaning to given words, it reverses the process, and when the meaning or idea is in the mind, it endeavors to supply the fitting term or phrase to express that idea. To obviate constant reference to a lexicon to discover the meaning of terms, brief definitions have been given before each word. As a dictionary is of service to those who need assistance in interpreting the expressed thought of others, the Thesaurus is intended to assist those who have to write or to speak to give proper expression to their own thoughts. In order to enhance the practical application of the book cross references from one caption to another have been introduced, and terms inserted under one caption when the name of the term per-

mitted. In the matter of synonyms of technical words the authors have performed for medical science a service never before attempted. Writers and speakers desiring to avoid unpleasant repetition of words will find this feature of the work of invaluable service. Indeed, this Thesaurus of medical terms and phrases will be found of inestimable value to all persons who are called upon to state or explain any subject in the technical language of medicine.

The editor believes that this book will become his constant companion.—H. V. WÜRDEMANN.

Collected Essays on Physiological Optics.

KOENIG, ARTHUR, late Professor at the University of Berlin. With a preface by Th. W. Engelmann, a portrait of the author, 40 figures in the text, and 2 plates. Leipzig, Joh. Ambr. Barth, 1903. M. 14. \$3.50.

Arthur Koenig occupied a prominent place among the investigators and promoters of the most important and difficult problems of physiological optics. His contributions being scattered in various periodicals, some of which were hardly accessible, this collection of all his essays in a uniform book will be heartily welcomed. Of the 32 papers we mention only a few, to show their importance. On dichromatic color systems, the sensitiveness of normal eyes for differences in the lengths of light waves, a simplified leukoscope, individual differences in the color sense, the vision functions of the Zulu Kaffirs, a case of violet blindness from pathological causes, the relation of acuity of vision and intensity of illumination, the recent development of Thos. Young's theory of colors, experimental researches on the psychophysical fundamental formula with regard to the physical sense, the influence of santoniate of soda on a normal trichromatic color system, the value of illumination of spectral colors under varying absolute intensity of light, a so far not observed form of congenital color blindness, the light perceiving layer of the human retina, the human visual purple and its significance with regard to vision, blue blindness, etc. The preface by Prof. Engelmann contains a short biography of Arthur Koenig, with due appreciation of his superior qualities as man and investigator. Print and paper are excellent.

C. ZIMMERMANN.

Studies on the Cortex of the Human Brain.

CAJAL, RAMON Y S., PROF., Madrid. Translated from the Spanish by Dr. J. Bresler, Kraschnitz. No. 4. The olfactory cortex in man and mammals. 195 pages with 84 figures. Leipzig, John Ambr. Barth, 1903, M. 7.50, \$1.85.

The great importance of this fundamental work of Ramon's on the brain was emphasized when we reviewed the three preceding Nos. of these studies, on the visual, the acoustic and motor cortices in the *ANNALS* of July, 1902, p. 610. The present number gives the results of R.'s studies on the olfactory cortex with the same thoroughness and revelation of numerous new facts. The central olfactory system comprises first, the primary center, the olfactory bulb; second, the secondary centers, consisting chiefly of the lobulus pyriformis, the grey substance of the pedunculus bulbaris, the lobulus frontalis, tuberculum olfactorium, and third, according to almost all authors, tertiary or terminal stations, of which the cornu Ammonis is the most important. Commencing with the olfactory bulb, the different parts of the central olfactory system are minutely described, according to R.'s novel investigations, especially the structure of the sphenoidal cortex. Like the other sensory cortices, the olfactory cortex of the gyrus Hyppocampi shows also a very characteristic structure, distinguishing it from the former by positive and negative signs which are enumerated.

According to R., the olfactory cortex of the human brain is the least developed of all sensory spheres. Even the superficial layer of the plexus of esogenous fibers gives it its appearance of lower animality, reflecting the character of the organization of the cortex in lower vertebrates. This arrest of development is easily conceivable by remembering that the olfactory sense of man is in a stage of atrophy, or at least in a resting condition, in contradistinction to the other senses, which in man and the higher animals have a progressive tendency of self perfection. It is impossible here to enter into further detail. A careful study of the book, which also in external appearance shows the same excellence as the former numbers, is highly recommended. C. ZIMMERMANN.

Ocular Therapeutics.

HANKE, VICTOR, DR., First Assistant at the University Eye Clinic of Prof. Fuchs, Vienna. Wien, Leipzig, Alfred Hoelder. 1903. 223 pp. Cloth. M. 3.20. \$0.80.

This book is intended to be a guide and work of reference to the practitioner in the treatment of eye diseases. After an introductory chapter on the methods of examination of the eye, massage, subconjunctival and intramuscular injections, dressings, hot applications, the diseases of the various parts of the eye are arranged in alphabetical order in their respective chapters. Short etiological, diagnostic, especially differential diagnostic, remarks precede the therapeutics, which, form the chief part of the book, followed by an appendix of prescriptions. The author speaks from his long experience, gathered at the clinic of Prof. Fuchs, and presents it in a very handy, complete and up-to-date form, including the most recent remedies. C. ZIMMERMANN.

Hungarian Contributions to Ophthalmology.

Schulek, W, Prof, Budapest. Vol. III., Leipzig and Wien, Franz Deuticke, 1903. M. 5. \$1.25.

The Hungarian contributions, of which 3 volumes have appeared, contain chiefly observations and experiences gained at the eye clinic of the University of Budapest, by Professor Schulek, his assistants and pupils. The third volume equals the preceding ones in interesting and valuable articles.

After a critical review of the surgical treatment of trachoma Dr. J. Imre describes his own method, which he calls abrasion of the conjunctiva and which proved in his large experience (500 to 600 cases annually) as the mildest and most successful procedure. He removes the diseased material by scratching the conjunctiva, stretched by double hooks, with the old scarification instrument. I. uses the galvanocautery only for the follicles at the lateral angle and in papillary thickening at the margin of the upper tarsus. In obstinate cases of papillary hypertrophy massage is applied with Knapp's roller forceps, the everted lid being supported by a caoutchouc plate and finally bluestone.

In the next article I. gives statistics on blindness in lower Hungary and recommendations for its prevention.

L. v. Blaskovics reports the results of open wound treatment, obtained at the eye clinic of Budapest in 1238 cases, from February, 1898, to October 1899. To secure restitution of the anterior chamber the eye is covered by borated lint and cotton, fastened with adhesive plaster, and the patient is to lie on his back from two to three hours. Then he is

allowed to sit in a chair. After 24 hours the dressing is taken off, but the eye protected by an uncovered wire mask of Fuchs, the room being half darkened. The secretions outside the palpebral fissure are washed off, twice daily, with luke-warm solution of boric acid. Ruptures of the wound after extraction of senile cataract did not occur more frequently than under bandage (9.1 per cent.). The results being the same, but the comfort of the patient much greater, the open wound treatment showed marked, and not to be underestimated, advantages over the employment of dressings.

In the following essay on operation of juvenile cataract v B. reports on 527 such operations and 36 for myopia, viz.: 90 dissection of cataracts, 20 for myopia, 287 simple extractions of cataracts, and 12 in myopia, 200 linear extractions of cataracts with iridectomy and 4 in myopia. The best results were obtained in extraction with preparatory (less frequent) or simultaneous iridectomy, the other methods were more unfavorable with regard to infection. v B. does not see any disadvantage in creating a coloboma, since it does not impair V. as his statistics show. This mode of operating juvenile cataracts was recently practiced at the eye clinic of Budapest, also for high myopia.

Under "Expulsive Hemorrhages from the Interior of the Globe," C. Scholz relates two cases occurring after iridectomy in complicated glaucoma. On account of severe pain enucleation was performed. The microscopic examination revealed hyaline degeneration of the walls of the blood-vessels of the retina and chorioid and obliterating endarteritis. At the clinic of Budapest such hemorrhages occurred only in 2 out of 2,972 operations for cataract. Prolapse of vitreous is rather a consequence than the cause of the hemorrhages, to which the free use of cocaine may predispose. They are not to be dreaded after iridectomy on glaucomatous, seeing eyes, but when blind and complicated by former inflammatory processes, especially when suspected of preceding retinal hemorrhages.

W. Leitner advocates, in his article on prophylaxis of blennorrhoea neonatorum, Credé's method to become compulsory for the midwives.

C. Scholz's paper on the history of the treatment of trachoma from ancient up to present times is very complete, and has a bibliography of 211 Nos.

The last essay on sympathetic ophthalmia by Professor E. v Grosz contains very instructive clinical histories of sympathetic ophthalmia after injuries by the horns of cows, after cataract operations, iridectomies, recent inflammation in shrunken globes, etc. The similarity of the pathological changes of both eyes suggest the same infectious matter as the cause of the uveitis of both eyes, which must be transmitted through the nerves, although, so far, not anatomically proven. It must take place analogously as in lyssa. G. postulates further investigations in two directions: to search for the infectious matter and to study the paths on which lyssa spreads, especially the time it takes from the date of inoculation of lyssa in the anterior chamber and vitreous until the optic and ciliary nerves of the other eye become virulent.

We heartily recommend this valuable and interesting volume for more minute study.

C. ZIMMERMANN.

Injuries of Eye by Gun Shot.

Lindenmeyer, Dr., Giessen. From the eye clinic of Prof. Vossius. Collection of Ophthalmological Essays, edited by Prof. Vossius, Vol. V. No. 1. Halle, a. S. Carl Marheld, 1902. M. 1. \$0.25.

L. reports 20 cases of injuries by shot, occurring at the eye clinic at Giessen within the last 10 years, which partly caused contusion with hemorrhage into the anterior chamber and vitreous, mydriasis, ruptures and dialysis of the iris, paralysis of accommodation, dislocation of lens, detachment and opacity of retina, subretinal and subchorioidal hemorrhages, rupture of the chorioid, partly perforations of the eyeball. Out of 9 perforating injuries 3 eyes could be preserved, and then only their form. Two cases of secondary suppuration in which enucleation had to be performed, were due, as the reaction with sulphureted hydrogen proved, to be chemical action of lead, and are reported in detail.

If a shot is lodged in the uvea the prognosis is very unfavorable, if in the more central portions of the vitreous, it may be encapsulated, but may be followed by cicatricial shrinkage of vitreous and detachment of retina. The most favorable course take double perforations of the walls of the globe as encapsulated foreign bodies in the orbital tissue heal kindly

The literature is amply utilized and the essay very instructive.

C. ZIMMERMANN.

Special and General Observations on Tuberculosis of the Eye.

Aschheim, H., Dr., From the University eye clinic of Bre-lau.
Ibidem. No. 2, M. 1. \$0.25.

The object of this essay is to give a critical review of the symptoms of ocular tuberculosis, as to their diagnostic value. For illustration A. reports 3 cases of tuberculosis with indefinite findings as to bacilli, experiments on animals and histological structures, two cases of apparent tuberculosis, of which one turned out as degenerated chalazion, the other as syphilis of the lid, and thus showed the insufficiency of the mere histological diagnosis.

The experimental, histological and bacteriological examination of sixteen cases of chalazion yielded a histological similarity to tuberculosis by the presence of Langhans' giant cells, but not one positive result in eighteen inoculations from thirteen cases, whence A. infers that only those chalazias are tuberculous, in which bacilli are found, or the experiment gives a definite proof of tuberculosis. These two conditions are, as A. sums up in his remarks, the certain criteria of the tuberculous nature of a process. A successful injection of tuberculin, and the anatomical picture speak with great probability of tuberculosis in doubtful cases. Likewise it is not justified to derive uncertain diagnoses from the clinical aspect alone. The essay is very well written and gives a very good and critical idea of the subject.

C. ZIMMERMANN.

Retinitis Pigmentosa and Glaucoma.

Weis, EDWARD, DR., Assistant at the University Eye Clinic at Giessen. *Ibidem.* No. 5. M. 4 \$0.50. \$0.20.

A case of far advanced retinitis pigmentosa with very marked degeneration of the retinal and chorioidal blood-vessels, posterior polar cataract, complicated by glaucoma simplex of the left eye, which is reported in detail, was for W. the incentive to search for a possible causal connection between both affections. In both diseases and degenerations of the bloodvessels are met with, in glaucoma acquired, in retinitis pigmentosa congenital, but so far W. is unable to prove any causal relation. A review of the vascular affections in both diseases from literature is given in a well arranged form.

C. ZIMMERMANN.

Anatomy and Physiology of the Circulation and Nutrition of the Eye.

LEBER, TH., PROF., Heidelberg. With 30 figures in the text and 5 plates. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde, 2nd, entirely new edition. Nos. 52 to 56. Leipzig, W. Engelmann, 1903. M. 10. \$2.50.

A comparison of the second edition of this chapter with the first shows at once that the author has written an almost entirely new work. The anatomical part has been doubled in size by the addition of new facts and of whole paragraphs on embryology and comparative anatomy and general reviews. The chapter on the lymphatic and serous spaces of the eye has grown from one and a half to nine pages, describing the system of ocular chambers, the outlets of the vitreous, the perichorioid space, the canaliculi of the cornea, etc. All formerly black figures have been replaced and augmented by colored ones and 5 excellent colored plates show the bloodvessels of the retina and iris of the newborn, the larger bloodvessels and capillaries of the chorioid at the macula lutea and at the equator.

The physiological part commences with an entirely new general chapter on the purpose of nutrition and the nutritive requirement of the single parts of the eye, the blood supply, the influence of the nerves on nutrition and growth of the eye, the temperature and the regeneration of the eye. Then follows a very exhaustive treatise on the pulsation of the arteries and veins of the retina. Under innervation of the retinal vessels the description shows how much recent experimental work has been done on the influence of the sympathetic nerve and of vasomotor centers on the retinal vessels. New special chapters deal with the influence of the drugs on the retinal vessels and the consequences of interruption of the blood-supply through the vessels of the retina and chorioid with observations on man and experimental researches on animal, the metabolism of the retina and optic nerve, the dependence of the nutrition of the retina, optic nerve and centers on the integrity of their mutual continuity, descending and ascending secondary degeneration, with conclusion, and regeneration of the retina.

The section on ocular humors, their secretion and excretion has grown from 3 to 90 pages and that on intraocular pressure from 13 to 60.

So many questions, intruding upon the mind in daily practice, and here exhaustively discussed in a purely scientific spirit, so that Leber's work will soon become indispensable to every ophthalmologist.

C. ZIMMERMANN.

Jubilee Edition in Honor of Dr. W. Manz, and Prof. Dr. H. Sattler.

Supplement to Vol. 41 of *Klinsche Monatsblaetter für Augenheilkunde*, edited by Th. Axenfeld and W. Uhthoff. Stuttgart, Ferdinand Enke, 1005. M. 14. \$3.50.

The first of this collection of 26 papers, containing observations made at the university eye clinics of Freiburg and Leipzig is by Prof. Th. Axenfeld, Freiburg: On the occurrence of detachment of the retina and the significance of general vasomotor disturbances in hydrophthalmus.

A. found detachment of the retina in 2 enucleated hydrophthalmic globes, and in a case of hydrophthalmus as the cause of blindness and following hypotony. In his opinion the detachment is due to analogous causes as in high myopia and occurs perhaps more frequently than so far supposed. A's and Heine's observations contradict the assertion of Angelucci that hydrophthalmus is invariably due to a general congenital angio-tropho-neurotic process.

W. Stock, Freiburg: Anatomopathological investigations on experimental endogenous tuberculosis of the eyes of rabbits.

S. injected, with Luer's glass syringe, an emulsion of tubercle bacilli in 1/2 to 1 ccm. of bouillon from pure cultures of human tuberculosis (4 to 6 weeks old) into the marginal vein of the ear and reports the clinical histories and anatomical conditions of his experiments on 20 rabbits. In all cases tuberculosis of the eyes was the result, but with varying course. Especially were differences noticed in the form of the affections of the chorioid, iris and ciliary body. In most cases this endogenous tuberculosis of the eye deviated entirely from that produced by inoculation of virulent tubercle cultures into the anterior chamber and vitreous.

Bietti, *Amilcare*, Pavia: Clinical and anatomical contributions to metastatic ophthalmia.

Three cases of metastatic ophthalmia of rare forms are given in detail with histological descriptions. In the first a bilateral metastasis by pneumococci apparently started from the chorioid, in the second restitution of V after amaurosis,

with healing of a total bilateral metastatic detachment of the retina was observed, and the third case, a puerperal infection, took a comparatively benign course, without leading, as usually, to perforative panophthalmitis.

Bietti, A.: On the histology of trachomatous pannus.

The trachomatous pannus may develop in two fashions, either below the epithelium like degenerative pannus, or below Bowman's membrane. A case of the first kind is histologically described.

Bietti: Which roll do diphtheria and kindred bacilli play in etiology of simple inflammations of the conjunctiva?

P.'s experiments on guinea pigs, rabbits and man, yielded the following results. In simple catarrh the bacilli of the diphtheria group, as a rule, have no other effect than the same avirulent germs of the normal conjunctiva, which multiply in the inflammatory secretions, without being their cause.

Derby, G. S., Boston: A melanosa sarcoma in the very first stage of development.

Kayser, B., Stuttgart: A primary sarcoma of the iris, starting from a naevus vasculosus of the iris.

Krukenberg, F., Halle: On metastatic carcinoma of the chorioid.

Tooke, F., Montreal: Anatomical examination of a gumma of the ciliary body.

The ciliary gumma developed immediately after secondary syphilitic iritis. T. emphasizes that syphilis of rapid course is apt to produce real gummata in the interior of the eye, especially in the ciliary body.

The clinical histories and anatomical conditions of all these cases of rare intraocular tumors are minutely described with due reference to literature.

Derby, G. S.: The dependence of the action of eye drops on their temperature.

D.'s investigations on animals and man showed that, at an average, warm eye drops act more rapidly than cold drops, and are more grateful to the patient. At the eye clinic at Freiburg the eye drops for the use in the polyclinic are kept warm in a thermophore.

Yamaguchi, H., Tokio: Contributions to the Pathology of the Optic Nerve in Brain Diseases.

A case of relapsing choked disc with thrombosis of the

central retinal vein in sarcoma of the frontal lobes. The intense swelling of the disc set in after atrophy and degeneration of the disc with shrinkage had existed for several years, and was due to thrombosis of the central vein, in consequence of strangulation by cicatricial tissue in the obliterating intervaginal space.

2. Atrophy of the optic nerve and anomalies of menstruation in basal tumors. Four cases of tumors at the region of the chiasm with simple atrophy of the optic nerves are reported as illustrations of the relatively frequent lacking of papillitis in tumors of this region, which may be explained by obstruction of the optic sheaths, by compression, cellproliferation, etc. The etiology of amenorrhea in these cases had to be attributed to the intracranial tumor. Thus Y. warns against too readily assuming an amenorrhea as the cause of atrophy of the optic nerves.

Levi, E.: Concrement in the excretory duct of the lacrimal gland.

It consisted of cells, probably epithelia of the excretory duct and incrustation with carbonate of calcium.

Schulz, W.: On epithelial tumors of the lacrimal gland.

A carcinoma of the lacrimal gland of the size of a walnut displaced the globe downward and inward and produced diplopia. Extirpation with temporary resection of the orbital wall, according to Kroenlein, restored normal mobility and vision. Histological description.

de Lietro-Vollaro, Raggio Calabria: Contribution to affections of the optic nerves in purulent cerebro-spinal meningitis.

The author reports five cases of meningitis, terminating fatally, with anatomical descriptions of the optic nerves. The obturating infiltration of the optic sheaths at the region of the optic foramen stops the free communication between intracranial cavity and intravaginal spaces and thus prevents the entrance of pus germs into the latter. L. infers from his cases a corroboration of the opinion of Axenfeld that the purulent ophthalmia in cerebro-spinal meningitis is owing to metastasis and not to a direct propagation through the optic sheaths.

The enormous perineuritic and interstitial infiltration of the optic nerve within its osseous canal is important for the bilateral retrobulbar blindness, so called "basal," remaining

for weeks after meningitis, mostly with negative ophthalmoscopic condition, immobility of the pupils, and frequently with ultimate recovery. L. does not doubt that it is due to the affection in the optic canal.

Hormuth, Dr.: On formation of anastomoses and their prognostic significance in thrombosis of the central retinal vein.

H. reports seven cases of obstructions of branches of the central retinal vein, mostly thrombosis, in which development of anastomoses, apparently through pre-existing capillaries, was observed and which led to restitution of function. Thus the formation of anastomoses is a favorable prognostic symptom. H. also communicates a case of preretinal and subretinal hemorrhages at the macula.

Werneke, Theodore, Odessa: A contribution to the pathological anatomy of dislocation of the lens and chorioretinitis, with remarks on deposits of lime and conglomerations of threads.

A case is reported in which the lens, dislocated for some time and in the stage of resorption, caused intense atrophy of the uvea and retina, hyaline membranes on iris and cornea, transport of lime to the sinus of the anterior chamber, formation of fibrin in its interior and conglomerations of threads, probably epithelial elements of capsular cataract.

Krückman, E.: On the glia of the optic nerve.

Bielschowsky, A.: 1. On a peculiar kind of "jumping pupils." Periodic mydriasis (9 mm.) and miosis (3 mm.) of the right pupil in a case of congenital paralysis of the third nerve alternated in intermissions of 20 to 30 seconds, the transition from the largest to the smallest diameter took five seconds, a little longer in the opposite direction. Synchronously with miosis the eyeball moved inward and downward, and returned to its divergence with beginning mydriasis. A contraction of the ciliary muscle and marked increase of refraction (proved by skiascope and ophthalmoscope) occurred simultaneously with the miosis.

A constant irritation from a former lesion, which increases or decreases with changes in the vascular innervation, acting on the nuclear region of the nerve, incompletely paralyzed, and varying reactions to reflex and voluntary innervations of the nuclear region may produce such a group of symptoms.

! 2. On periodic unilateral miosis.

Birch-Hirschfeld, Dr.: A case of intense deformity of the eyeball and a contribution to hemorrhagic glaucoma.

Vetter, Dr.: A case of bilateral hysterical amaurosis.

V. shows that the diagnosis of hysterical affections of the eye without positive manifestations of general hysteria may sometimes hardly be possible.

Emanuel, Carl: On the genesis and the nature of tumors of the retina.

Prinke, Theodore: On injections of india ink into the eyeball.

P. investigated the transport of injected india ink in the anterior segment of the globe on eight eyes of dogs and one human eye, before enucleation, with the following results:

It is more than probable that a portion of india ink, injected into the vitreous, is excreted by the vessels, communicating with the canal of Schlemm. P.'s specimens showed, however, no entrance of india ink into the vessels of the ciliary body or iris without phagocytosis by leukocytes.

Thye, A.: Bilateral congenital defect of the anterior stratum of the iris in two generations.

This peculiar defect has not yet been described. It consisted in the lack of the stroma proper of the iris in less or greater extension, while the pigment layer, which develops from the retina, was perfectly formed. Since there were no remnants of a previous inflammation, T. assumes a defective condition of the proton, which certainly may be propagated through several generations.

Dahlstrom, A., Upsala: Arthritis in blenorrea neonatorum. D. compiled 18 cases from literature and two of his own observation. The conveyance of gonococci to the joints may take place from a possible simultaneous infection of the urogenital system, from corneal ulcers, or from the conjunctiva without any lesion of continuity through the lymphatics and the blood. The latent stage of gonorrhoeic arthritis probably does not exceed four or five days.

Ludwig, Arthur: Demonstration of protrusion of the globe in voluntary widening of the palpebral fissure.

L. demonstrated, by means of photography, a protrusion of 0.85 mm. of the globe when the width of the palpebral fissure increased 10.00 to 14.8 mm., which corresponds with

the average figures of former investigations by different methods.

This short review was intended to show the abundance of interesting contents of this volume worth while to be read in the original.

C. ZIMMERMANN.

Manual of the Diseases of the Eye for Students and General Practitioners..

MAY, CHARLES H., M. D., with 275 original illustrations, including 16 plates with 36 colored figures. Published by William Wood & Co., New York, 1903.

This revised third edition of May's Manual does not need any introduction to the ophthalmic teachers of this country. The book has not been increased in size but some new illustrations have been added and generally brought up to date as regards new methods of treatment and remedies. The reviewer finds, however, that the newer ideas as to the etiology and treatment of strabismus receive scant mention and some of the newer remedies as Adrenalin, Argyrol, Diognin, etc., are either but slightly mentioned or ignored. The author says under the head of Thrombosis of the Central Retinal Artery, "There is no treatment," but I hardly think he would allow a patient to go away without some treatment. A radical cure by deep massage in recent cases has been reported. If in the chapter on Ocular Therapeutics the author would substitute the metric system for the apothecaries' system, or give the amounts used in the various prescriptions in both the metric system and the old system, it would be a good feature. The binding, printing and paper are well maintained in this edition as well as in the others, and the volume can be heartily recommended for students and general practitioners.

NELSON M. BLACK.

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